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MILWAUKEE, MAY, 1885.

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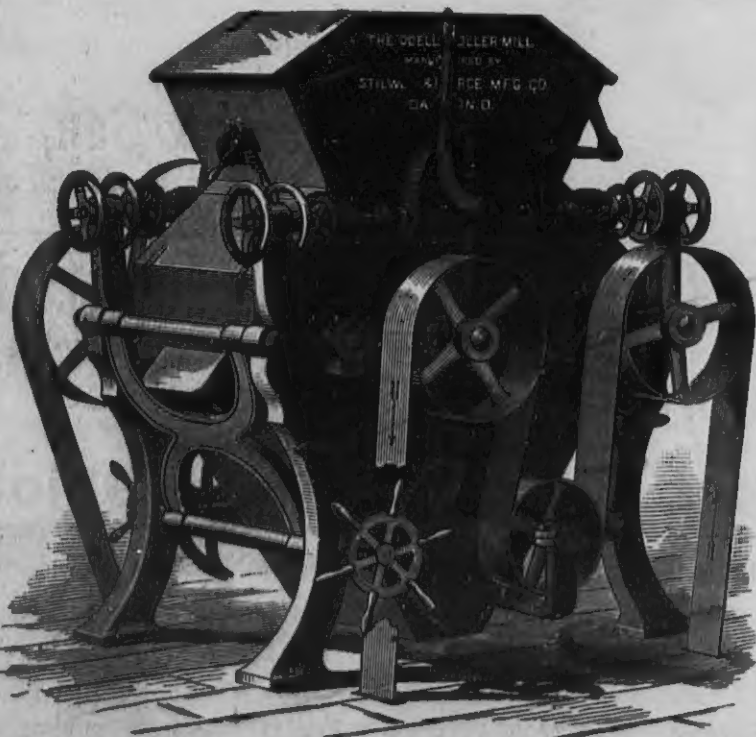
DEAR SIR:—I cheerfully accept the New Roller Mill that you have built in the place where the old buhrs and other machinery were taken out, and must say that it is fully up to my expectations in every respect, in workmanship and quality of flour produced.

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4. It is the only Roller Mill in which the movable roll-bearings may be adjusted to and from the stationary roll-bearings without disturbing the tension-spring.

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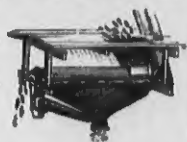
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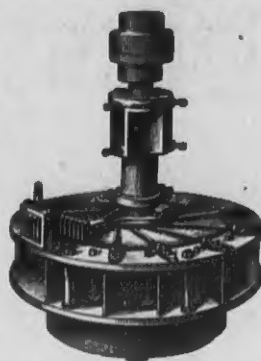
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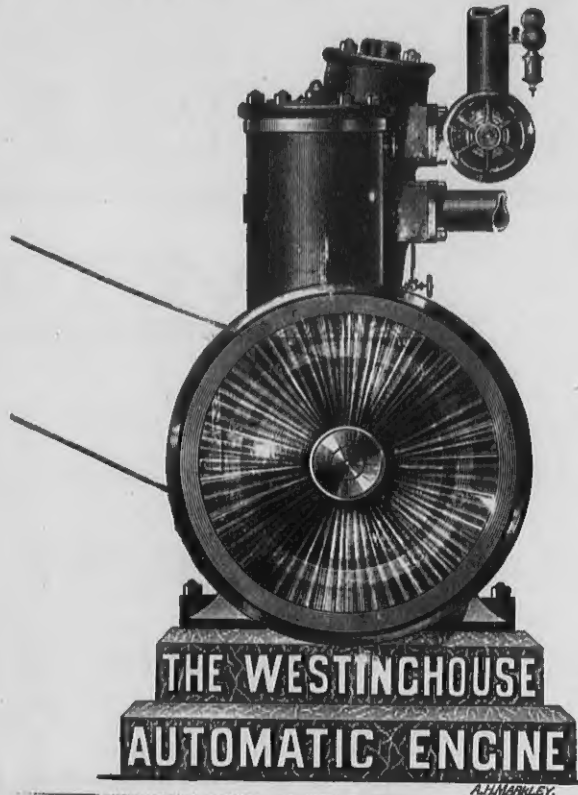
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These Towels are much more economical than waste; more convenient. They can be washed easily and quickly, and used again. Little or no danger from fire. They are now in use in the largest factories in New England and on the ocean steamers.

SIZE No. 1, 15 x 15 Inches.
" " 2, 30 x 15 "

PRICES.

	No. 1	No. 2
Per Dozen.....	\$.75	\$ 1.00
Per Hundred.....	5.00	7.00
Per Gross.....	6.00	8.25
Per Thousand.....	32.50	46.50

Please give them a trial. We can send 3 dozen No. 1, or 2 dozen No. 2, by mail.
Please send your orders to

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Is furnished by the fact that these celebrated machines will be used by Messrs. C. A. PILLSBURY & Co, in their new

PILLSBURY "B" MILL

All bidders for the work of constructing this immense mill being required to figure on using the Gray Roller Mills. The selection of these machines for the new "B" mill was the result of several years practical test in the other mills owned by the same firm in competition with various other roller mills, the decision being unanimous, that, in all particulars, for practical work in the mill, Gray's Noiseless Roller Mills were superior to all others.

We wish to assure our customers who may not wish to build 2000 barrel mills, but who wish to build mills of smaller capacity, that no matter what size mill they desire to build, or how small its capacity, the **GRAY ROLLER MILLS** are the best they can use, and we shall at all times furnish machines equal in every respect of material and workmanship to those which will be used in the new Pillsbury Mill.

EDW. P. ALLIS & CO.,

RELIANCE WORKS,

MILWAUKEE, WIS.

Sole Manufacturers of Gray's Patent Noiseless Roller Mills, adapted to
mills of any desired capacity.

The United States Miller



Published by
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MILWAUKEE, MAY, 1885.

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COST OF THE NATION'S FOOD.

An interesting branch of Mr. Edward Atkinson's discussion of the "Distribution of Products" relates to the aggregate annual cost of the nation's food supply, the average cost of individual nourishment, distributed among the various articles of consumption, and the profits of retail traders. In addition to the matter contained in his book, Mr. Atkinson has favored us with the graphic illustrations which are presented below. The scope of the inquiry may thus be easily grasped.

In the first place, it is evident that a definite average cost of subsistence can be reached only through the collection of a wide range of data. Exact information upon this point cannot be easily obtained. Certain of the bureaus of statistics of labor, however, have turned their attention to this subject, and others will doubtless do so in course of time, so that by and by the relative proportions and cost of the food consumed by families throughout the country may be perfectly well known. Such information, Mr. Atkinson thinks, would help forward improvements, in the distribution of food.

But, while hard and fast decisions cannot yet be laid down, some suggestive conclusions may be drawn from such facts as are at hand. Two sets of expense bills are made the basis of the author's study. One of them presents the actual cost of feeding seventeen adult men, most of them mechanics hard at work, and eight women, three of whom were servants, for six months in 1884, in a manufacturing village of Massachusetts. The other statement shows the cost of the food eaten during the same period by seventy-two adult female factory operatives and eight servants in Maryland. It may be assumed without violence that the average of these two tables would be no more than a fair daily ration for all adults. Table A shows the two rations, separated under eight heads, and their average per day, per week and per year, and also the sum and proportions of this average, if served to a population of 57,000,000 computed as equivalent to 50,000,000 adult consumers, as the population of the United States is now or soon will be.

Mr. Atkinson's comments on the facts here presented are highly entertaining and instructive as well. Looking first at the various kinds of food it will be seen that the consumption of flesh at the Massachusetts table is much greater than in Maryland, due, no doubt, to the circumstance that the

sharers in the former are mostly men and the latter women. Perhaps the same thing is true of the use of milk, cheese, butter and eggs. A more detailed statement of the Maryland expenditures would show a very small use of cornmeal as compared to wheat flour, a great quantity and variety of vegetables, an absence of the New Englanders' fish-balls and baked beans, and a large proportion of beef to all other meat. Nearly every one, Mr. Atkinson says, will be surprised at the relative cost of sugar as compared with flour. But these instances are not exceptional—such is an almost universal rule, although the Maryland women unquestionably ate a disproportionate quantity of sweetstuff. The enormous value of dairy products made way with is also striking.

Returning again to the first and second columns in the table, it appears that, at the average prices and amounts reported, each of the Maryland operatives consumed daily one-half to two-thirds of a pound of meat, one-half pint of milk, one and one-half ounces of butter, one-half an egg, three-fourths of a pound of bread and two and one-half to three ounces of sugar. At the same time the Massachusetts mechanic's ration included one-half pound to one pound of meat and fish, according to kind and quality, flour and meal sufficient for three-fourths pound to 1 pound of bread, three to three and one-half ounces of sugar and syrup, and one-half to two-thirds of an ounce of tea and coffee. On the basis of these and other data Mr. Atkinson says that an ample and varied supply of nutritious food can be supplied in the eastern parts of the United States at a cost not exceeding 20c. a day or \$1.40 per week, and probably for a less sum in the West, provided it is judiciously purchased and economically served. At the average rate above shown, which is in excess of this estimate, the food of the nation cost last year \$4,240,500,000.

Carrying out this computation a little further, the estimate is reached that the whisky and beer bill of the American people amounts to about \$400,000,000 per annum. Altogether, therefore, food, drink, domestic fuel and light cost consumers \$4,500,000,000 to \$5,000,000,000, and clothing, carpets and other textiles over \$1,500,000,000 a total of \$6,000,000,000 to \$6,500,000,000 out of a value of \$10,000,000,000 to \$10,500,000,000 of total annual product. The proportionate expenditures of the people of the United States last year for food, clothing and shelter for the increase of population, it may be said in passing, appear to have been as shown in table B.

It will be observed that the supplies of food under consideration represent purchases made in considerable quantities and substantially wholesale prices—the supplies of large boarding houses. No one can doubt, Mr. Atkinson points out, that the actual cost of food prepared for use in workingmen's families would be 25 to 40 per cent. more than the above standard of 20c. a day in the more densely populated parts of the country, or else if only 20c. a day were spent it would fail to yield so good a subsistence as is obtained in the establishments cited, for want of skill both in buying and cooking. The rations indicated are no doubt above the average, both in quantity and variety, especially in respect to the colored and poor white population of the south. But very few working people anywhere enjoy so ample and good a ration as either of these for 20c. or even 28c. a day.

The question whether the retail cost of the food of the poorer people, who are compelled to buy in small quantities, cannot be reduced in some way is one of great importance. It appears that in New York or Boston the cost of bread is less than 3c. a pound, and that it can be profitably sold at 4c. a pound profit, or at 6c. for a loaf weighing 1½ pounds if the sales are made on a large scale over the counter for cash. But the price of bread in Boston in the small shops is 5c. to 8c. a pound. Fish, meat, vegetables and fuel are sold in small quantities at quite as great an advance on the first cost. Four bushels and a half of wheat, worth \$3.60 in Dakota, becomes a barrel of flour when milled, and the bread made therefrom has cost all told, when ready for distribution, 3½c. per pound, or \$10.92. For this bread the poorer people of Boston pay the baker \$18.

In addition to ordinary retail profits the consumer pays the penalty of waste, most articles of food being subject among Americans to great waste in cooking and consumption as well as purchasing. This is a matter of the utmost moment for the common laborer in a large city. And accordingly Mr. Atkinson adds: "Cannot a waste of food equal to 5c. a day on the average be prevented? Whoever teaches the masses of the people how to get 5c. worth a day more comfort or force out of the food which each one consumes will add to their productive power that would be equivalent to \$1,000,000,000 a year in value. Cannot bread be served to the workmen of Boston at 3c. a pound as well as in New York or in London. Cannot methods be adopted for bringing milk and vegetables within easier reach of the poor?"

THE UNITED STATES MILLER.

TABLE A—COST OF FOOD PER INDIVIDUAL AND PER AGGREGATE OF POPULATION.

	Per Individual.					Total population of 50,000,000 per year.	Relative Amounts of Each Kind.
	Cents per day Md.	Cents per day Mass.	Cents, average per day.	Average per week.	Average per year.		
Meat, Poultry and Fish.....	7.58	11.83	9.70	\$0.6790	\$35.31	\$1,765,000,000	
Dairy and Eggs.....	3.84	7.37	5.60	.3920	20.38	1,019,000,000	
Flour and Meal.....	2.09	2.90	2.50	.1750	9.10	455,000,000	
Vegetables.....	2.39	1.58	1.98	.1386	7.21	360,500,000	
Sugar and Syrup.....	1.98	1.90	1.94	.1358	7.06	353,000,000	} Considerably above an average consumption.
Tea and Coffee.....	0.86	1.18	1.02	.0714	3.71	185,500,000	
Fruit, Green and Dry.....	0.50	0.73	0.62	.0434	2.26	113,000,000	
Salt, Spice, Ice, etc.....	0.46	0.52	0.49	.0343	1.78	89,000,000	
TOTALS.....	19.70	28.00	23.85	\$1.6605	\$86.81	\$4,340,500,000	

TABLE B—EXPENDITURES FOR FOOD, CLOTHING AND NEW SHELTER.

1. Food on the basis of the rations served to factory operatives in Maryland and New England. Drink, as recently computed by David A. Wells.	
Food.....	\$4,340,500,000
Drink.....	474,823,000
Total.....	\$4,815,323,000
2. Clothing ready for use, carpets, blankets, laces and all other articles made from vegetable or animal fibres, on the basis of a computation from the census returns, the figures of the imports and an estimate of the cost of converting cloth into clothing.	
Clothing, etc.	\$1,740,000,000
3. Shelter for the increase of population, now approximating 2,000,000 per year, on the basis of one dwelling or part of a dwelling to each five persons, at an average cost of \$500, or \$100 per capita.	
Shelter.....	\$200,000,000

TABLE C—ARABLE LAND COMPARED WITH THAT UNDER CULTIVATION.

	Sq. Miles.	About 1/2 Arable.	1/2 Grazing.	1/2 Mountains Forest and Mines.
Total area United States.....	3,000,000			
Indian Corn.....	90,000	At 31 bushels to an acre will produce over 1,800,000,000 bushels—about the crop of 1884. At 5 pounds corn to 1 pound pork, one-half the crop would give 33,000,000 casks of pork.		
Dairy and Eggs.....	60,000	At the ratio of 1 cow to 2 acres would sustain 19,000,000 cows. Number in 1880, 12,500,000. By means of ensilage and cottonseed meal two cows can be sustained to 1 acre of cornstalk.		
Wheat.....	60,000	At only 13 bushels to an acre will yield over 500,000,000 bushels.		
Mutton and Wool.....	40,000	At 5 sheep to an acre, 102,400,000 sheep; at 4 pounds per sheep, 409,600,000 pounds.		
Beef.....	30,000	At 1,100 pound meat per acre, 1 pound beef per day for 58,000,000 people. By means of ensilage and meal from the corn area this can be done, whether at a profit or not remains to be determined.		
Cotton.....	20,000	At half a bale to an acre, 6,400,000 bales.		
Total assigned.....	300,000			

Corn, wheat and cotton, actual on our present wasteful modes of agriculture.
Dairy products, beef, mutton and wool possible, but not probable for many years

Cannot the distribution of meat, bread, fish, vegetables and milk be organized and made profitable with large sales at small profits as well as the distribution of calicoes, blankets and petticoats?"

Granted that these questions can be answered affirmatively, the whole tendency of the inquiry is to refute the dreary doctrine of Malthusianism. The rate of wages measures the laborer's share of what is produced but the total annual product of the country's industries, Mr. Atkinson contends, is in excess of all the wants of our whole population. "The rate," he says, "would suffice for an ample subsistence for every man, woman and child in all our broad land, if only the mechanism and the metaphysics of distribution could be brought within the rules of social science." What this means is indicated in part by Table C, which shows that the possibilities of the soil of the United States for the production of food have as yet hardly begun to be made use of. The area of the United States, omitting Alaska, is substantially 3,000,000 square miles. In Table C will be found a comparison of the total area of arable land, with the areas actually under cultivation, in grain and cotton (in round figures, disregarding fractions), and the areas which would suffice for meat, dairy products and wool, if special modes of agriculture now in use should become general.

—Bradstreet's.

THOSE PLAQUY BELTS.

How many pounds of lace leather do you use in a year? Figure it up and see what it costs you. Figure up how many inches of belting you waste every year by cutting off the ends where the hooks or lacing has broken out, and then figure how many hours have been wasted in stopping to lace belts. Get all these figures down fine, and then go to town and learn to make a cement joint. Get some leather cement if you want to, or get some "isinglass" or fish glue, and make the cement yourself. Use one part fish and two parts of common glue. Cut the belt just once and a half its width too long. Scarf the ends a distance equal to the extra length. Make the scarf very smooth by finishing with a smooth plane. Take a very little hot cement on the brush, and work it into the splice. Rub both ends until it is just wet—not covered. The less cement you get into the joint the stronger it will be. Put the splice together on a hardwood board, or, better still, a smooth iron. Hammer lightly with a round faced hammer, and then drive a row of shoe pegs all around the splice. Don't try to drive the pegs with the belt on iron. You want a soft pine board for this business. After pegging, trim with a sharp knife. Cut all the pegs off close to the leather. In ten minutes the belt will be ready to go to work. It would be better if it could stand an hour or

two after splicing, but the glue sets very quickly, and a joint seldom comes apart. Try the cement joint and see how much nicer everything runs. Put a cemented belt on one pulley of an upright molder and run the other spindle with a big laced joint. What a difference you find. The laced belt makes you think of a shaker to a grist mill, while the cemented belt runs smooth and nice, and you don't hear it at all. Try cement joints. Put them in big belts, little belts, old belts and new belts, and you will never use another piece of lacing or another belt hook.

It takes longer to make a cement splice. You can lace three belts while you are cementing one, but you have to lace that same belt four or five times before one cement splice gives out. Figure that up, too, and put it beside the pile of lace leather and torn belt ends, belt hooks and malleable iron clasps. Last week we went into a mill where the belts all ran true, straight and silent. Every splice was cemented. Not a laced joint in the mill—and there never will be as long as the present owner runs it. If your belt stretches and you want to take it up you can cut it at any place. If a certain spot has stretched, you can cut it there and straighten to suit. Perhaps it is a very short belt and will not bear to have a "row of holes" cut off of it as you would have to do with a lace belt. You can cut a quarter of an inch or less from a cement joint, and get the belt

just long enough. Patched up belts are poor things to have. Pieces two, three, four and five feet long laced into a belt don't carry the power as it should be carried. Cement all these odds and ends together, and you will have a piece of belting that will surprise you. A mill hand will never mend a belt as long as it holds together. It may be torn half way across, or the lacing broken and torn, but it has got to run until it breaks clear off and comes flopping down around his ears, or winds up around the shaft and proceeds to thresh three feet of belt against gas pipes, shippers and the floor until the men above think the room below is full of condensed earthquakes. When the mill hand gets this belt down and mends it, he will work a piece of five-inch into that six-inch belting every time, unless you stand over him with a club, and then he will get a "twist" into the belt and have to take it apart again.—*Lumber World*.

WHEAT CLEANING.

Some one has said that "wheat well cleaned is half milled." This may be putting it a little strong, but it is a fact that improperly or cleaned wheat can never be well or properly milled; it can be ground, bolted and packed in barrels or sacks, but it will not make good, white, clean flour. It is not our intention or purpose to write a treatise upon wheat cleaning, yet a few ideas and suggestions, gathered from an experience of nearly thirty years in building and adapting machinery for properly handling and cleaning wheat of all kinds and qualities, and in all conceivable conditions, will not be deemed inappropriate in connection with this descriptive catalogue of our manufactures. First, please take into consideration the fact, that in the construction of a mill, the machinery for cleaning the wheat is the most important. If that class of machinery is defective, the wheat will be imperfectly cleaned; and if the balance of the machinery for reducing wheat to flour is all first-class, the final result will be unsatisfactory. In a mill of any considerable capacity, a full line of cleaners, consisting of the milling separator, the combined smut machine and the brush machine, should be used in the order here given. In some instances, between the separator and the brush, two smut machines, used continuously, are thought to be advisable to thoroughly and economically clean and fit the wheat to be manufactured into flour. Wheat, as it comes into the mill from the farmer or the warehouse, has incorporated with it many loose, extraneous substances. The removal of these, while essential, is comparatively easy of accomplishment by the aid of the mill separator, provided with a series of graded sieves and powerful air suction. Attached to the wheat berry, however, are impurities of many kinds—fuzz, smut, etc., etc.—the removal of which is a matter requiring time and specially devised machinery. Our experience has demonstrated that these adhering impurities are best removed by frictional contact of the wheat upon itself, and smooth surfaces in the scouring case, and actuating device by which the frictional contact is kept up. Roughened surfaces or projections of any kind in the casing in which the cleaning, scouring or

smutting is being carried on, have a greater or lesser tendency to abrade the bran of the berry, and this, for reasons that are obvious, is highly undesirable. The smutter or scourer should be *thoroughly ventilated*, and in such a manner, that as soon as any particle of impurity is freed from adhesion to the wheat berry, it may escape through the perforations of the scouring-case; more than this, it should be forced out, because, if permitted to remain, it will, if of a smutty character, be rubbed on and into the crease of the berry, to be freed therefrom only as the reduction of the wheat to flour takes place, and will thus become incorporated with the flour, from which no after process of separation will remove it. Our idea of perfect cleaning is, that the wheat, in addition to thorough ventilation while scouring, should pass through a strong current of air before it goes to, and after it leaves, the smutter. Where this system is followed, each machine, if properly constructed, will handle the material lightly and without waste, and when it has passed through the whole line, the smut, dirt and filth will be effectually removed, leaving the bran intact, and not liable to be pulverized in the process of reduction, or to be mixed with, and darken, the flour. Another important consideration in selecting a line of machinery for cleaning wheat, is to select the whole from the same manufacturer; when machines to constitute a full line are ordered—say one or two—each from different manufacturers, the result is invariably unsatisfactory, for the reason, if for no other, that the number of machines used by the different manufacturers do not correspond in capacity; in such cases the result can easily be imagined. In selecting machinery, be careful to select the best.—*From Howes & Ewell's Catalogue*.

THE SMALL SHOP.

The large factory in this country has to a great extent superseded the small shop, the latter not being generally able to compete with the better facilities and greater capital of the former. Yet it is not an assured fact that the small shop will be permanently abolished, at least so far as many lines of manufacturing are concerned. The profits of the small maker must necessarily be greater *pro rata* than those of the large maker, but there are some kinds of work that can be done to better advantage in the small shop, and which, owing to favorable facilities, can be made at a remunerative price. In some countries, notably Russia, Germany and Switzerland, the small shop system prevails, and is likely to continue for many years. But generally speaking, there is little chance for the individual workman or the very small manufacturer to hold his own against large establishments where steam power is applied to the running of numerous machines, especially where automatic machinery is employed.

However, something may be said against large shops. In these institutions there are frequently found wasteful methods. There is waste in fuel, in the use of material, in the manner of producing, in the employment of labor, and scores of ways which cannot be foretold. On the other hand, it must be remembered that there is a large margin for such waste. Thus in a works where 5,000 machines are annually turned out, a profit of \$5 on each

machine would give a very respectable aggregate on the year's business; but a small maker who could not produce over 50 such machines in the year could not afford to make them for less than \$10 profit per machine, even could he produce at the same cost as those made in the large works. Here, then, is a margin for wastefulness of \$25,000 a year in favor of the large works. In other words the latter could not compete with the small maker and yet suffer the above large loss. But if the small maker can produce a better machine, or one more salable, or can introduce some cheapening process whereby he can reduce the comparative cost of his productions, he may be enabled to hold his own even against the greater capital and better facilities of his competitor.

There are some things which may be produced to better advantage in the small shop—such as require fine hand work or very accurate mechanical skill applied to small details of work. The artist painting his picture in the quiet of his studio can unquestionably do finer execution than though working amongst hundreds of fellow artists. Quiet and repose of mind are essential to the performance of the highest duties pertaining to artistic or mechanical labor. While the artist or machinist—and the latter is often an artist—may do excellent work even amid surrounding noise and confusion, it is rarely that one is found who can do his best under such conditions.

It is probable that home-work or small shop work will be greatly facilitated by the introduction of small motors and handy but inexpensive machinery. This will be true particularly in cities where compressed air or steam power will be supplied to small users, who will have to pay for only so much power as they employ, and who will not be required to erect an expensive plant in order to supply their limited wants.

There is much to be asserted in favor of small shops, and indeed there is much to be argued against them. The owner may be said to be his own master, but this is in a sense true of the workman in the large establishment. To the owner of the small shop there are always before him great—we might say unlimited—possibilities. How many of our noted manufacturers have risen by successive stages from the small shop? The maker of a hundred machines may some day become the maker of ten thousand. The owner of the small shop is master of his time, and may devote a share of it, if he chooses to self-improvement—a wise thing to do. But with this broad liberty there are coupled duties and responsibilities. In times of business depression, losses and cares come upon him, and he has no one to share them with. The workman, on the other hand, at worst only suffers a diminution in his wages, and the greater loss falls upon his employer.

The small shop owner, to realize the greatest success, must not only pay a due regard to close methods of economy, but he should also employ the best material and the best skill. It is very essential that great attention should be given to these matters, for reputation for producing superior work is an excellent capital, and often does more than money can do towards building up a business.—*Industrial World*.

HOW CLEVELAND DEFEATED THE BOASTING CHECKER-PLAYER OF THE VILLAGE.

There comes a pleasant story to my ears of President Cleveland, says a writer in the *New York Times*. "Cleve"—his title in the days I write of—happened to be spending a few days at the home of a relative in a reposeful hamlet. The young man's visit was during the winter, when the place was desolate and dreary enough. When he got his bearings, tired of tramping about in the snow and ice, he sometimes dropped into "Uncle Silas's," the village store. One gray-skied afternoon he came upon the regulation circle of gossip. One of the characters of the place was sandy-haired, small-eyed, pucker-faced Ike Sanders, a prodigious boaster. This local Sir Oracle was a confirmed checker-player. Lazy and shiftless, the long winter hours were passed by him up at Uncle Silas's, where from a favorite corner he watched for victims. On the afternoon that Grover entered the excitement over in the corner seemed to be running over. A mild-faced, middle-aged little man was nervously bent over Ike's slow and impressive moves on the checkers. The game was close, and Sanders's opponent, no other than the village schoolmaster, had held a slight advantage; suddenly Ike surrendered one of his men to the foe, who promptly seized the opportunity. Another man was yielded, and the trap became apparent, and the devoted dominie rushed to his ruin.

"Ha-ha! ho-ho! Why you can't play checkers any more than you can scrape the sky," was Isaac's taunt as he grasped his victory.

The poor schoolmaster, his thin cheeks pinkish with mortification, shrank back with a faint excuse for his defeat. Ike carelessly rearranged his draughts, boastfully placed the board over on the firkin, and looked up with a challenge in his eye. "Say, Uncle Silas," he called out, "have ye got anybody else thinkin' they can play checkers here? No? Well, put the board away." Uncle Silas admitted that Isaac was master at the game, and was making preparations to place the checkers on the desk, when the young stranger pitying the defeated schoolmaster, found voice:

"I say, Mr. Sanders, would you mind trying a game with me?"

"With you? Sho, young fellow, you don't want to play against Ike Saunders!"

"Well, I would be willing to try."

"Oh, come, you can't play nothin' against me; I'm tired of beatin' this village, anyhow; now take the advice of a friend, and don't waste your time, young man."

"I might give you some trouble, though."

"Humph! you're sassy enough about it, and to take down your conceit a peg or two I'll let you have a game."

Once more the firkin was moved into place, and the knot of spectators peered over the shoulders of the contestants, and old Silas again resumed his wonted attitude. As the game advanced there was no sound in the room save the clatter of the wooden blocks as they were changed from square to square. The young player's black men wedged themselves boldly in among the "whites." Isaac began to pucker up his thin lips. Soon his fingers opened and shut nervously as his fist lay against his hip and his left foot tapped impatiently on the pine boards. His moves became

hasty and his manner irritable. Lookers-on took in the situation; glances of relief were interchanged, some bolder ones nudging their neighbors, and soon half-suppressed snickerings were heard. Ike didn't "know what folks meant by disturbing the game." When a few more moves effectually placed him in coventry, and his remnants were completely hedged in he began really to understand; his under lip dropped, and he had only voice enough to murmur: "Wa'al, the first game's yourn, and that's all ye kin reckon on." The second game started. The result was as before. Ike's enemies crowded round to see him "put down by that there young Grove, Cleveland." Another and another victory was wrested from the crestfallen Ike. When the fifth contest failed to change the tide, Sanders, unable to control himself longer, dashed board and checkers to the floor, and pushed his way out through the door, followed by jeers and laughter from former victims now become tormentors. Young Mr. Cleveland received enthusiastic congratulations, his eyes flashing triumphantly and a smile lurking in the creases of his chubby face. It is related he only laughed quietly the next day, when he heard the dictum of Mr. Isaac Sanders, which has made a good many folks in these later days rank plagiarists: "Some folks do have dod-gasted luck!"

A GROWING ENTERPRISE.

THE MILLERS' AND MANUFACTURERS' MUTUAL INSURANCE CO.
[From the Northwestern Miller.]

A representative of this Journal who recently called at the offices of the Millers' and Manufacturers' Mutual Insurance Company of Minneapolis, Minn., found Secretary Shove buried up to the eyes in business, but managed to hold his attention while putting a few questions regarding the condition and prospect of the company. Mr. Shove said:

"This company was organized in 1881 with a charter which gave the company the privilege of writing only on flour mills, manufactories, elevators and their contents. The flouring mills of the west as a class are either so poorly constructed, or their management is so indifferent that financial reverses seem to produce ash piles rather too often to be remunerative to other classes of property insured with them. There is also as much difference as to construction of flour mills as in any manufacturing establishments, and until the time comes when flouring mills are built with a view to permanency, filled with improved modern machinery, so well ventilated and roomy that they may be kept clean, constant care and caution used, built in a position where the surroundings will warrant a mill from a financial standpoint, some other classes of risks are better for the company. A mill thus described, of which we have a goodly number, this company will write on freely. By extending our business on to other first class property we can weed out those indifferent mills, running down our loss ratio, thus making a saving larger than we otherwise could do, and return to our members having good mills a dividend large enough to stimulate them in making the modern improvements for protecting their property."

"Have you changed your rules and instructions?"

"Yes sir," was the reply. This company will in future be governed by the following rules, viz:

"Doing all business direct with its members."

"Paying no commissions to agents or brokers."

"Selecting the risks to be insured."

"Making all policies large enough to warrant an inspection of the risk from two to six times a year."

"Exactng from its members full compliance in every respect with the demands of thorough, tried inspectors."

"A careful study of risks assumed morally and physically, as well as the surroundings."

"By adhering strictly to these principles a large saving will be made to our members in the way of commissions, brokerage and dividends, which stock companies must pay. By avoiding these items this company of necessity will have a much lower loss and expense ratio."

"What other regulations do you rely on for building up your business?"

"By following the course of systematic inspection our members will soon become educated as to where their danger lies and will remedy all defects, as there is no business to which the old saying, 'An ounce of prevention, etc.' is so applicable as in fire insurance. With care, order, cleanliness, steam pipes well secured, safe heating and lighting apparatus, buildings of good construction, the cost of insurance will be light and our members will soon see that the position taken by this company is to prevent fires rather than pay losses. The lower we can get our expense and loss ratio, the greater will be the returns to our members. When we can, so to speak, make the insured and the company's interests identical in preventing fires, then will success be attained and losses brought down to a minimum. Thus, we may say, the higher the standard toward perfection that we reach, the lower must be the rate."

"How does this policy compare with that of the stock companies?"

"The position taken by stock companies is the opposite. The rate made by them is based on their losses, expenses and dividends—the result of doing a promiscuous business, without regard to kind or character. This last assertion may be denied by our stock brethren. However, that may be, it is safe to go farther and make the statement broader, and say there is not a risk in the northwest that is so bad, or the moral hazard so questionable, that it will not find a ready taker among the stock companies. With mutual companies it is never so much a question whom they can get to insure, as whom they will accept. In other words, they make it a privilege to hold their policies. It is useless for you to fight against the rate made by stock companies, unless you use the one weapon, mutual insurance, as when it is once known that a party is prepared to join mutual companies, a reduction in rate soon follows for that party. This company enters the insurance field to write only upon such risks as mentioned above, letting the poor risks seek indemnity where they choose."

"Who are the officers of the Millers' and Manufacturers' Mutual?"

"Wealthy, reliable, conservative, shrewd and popular business men, who are at their desks every business day. E. R. Barber, of D. R. Barber & Son, is president; C. McC. Reeve, of the Hall & Dann Bbl Co., vice president; V. G. Hush, banker, is treasurer, and your humble servant secretary."

"What is the financial condition of the company?"

"The following statement will answer that question. I am proud of it, and don't think you will want a better answer:"

Contingent fund.....	\$187,478.81
Loans and discounts.....	10,389.36
Cash on hand and in bank.....	28,938.75
Due from other companies.....	3,246.01
Office furniture.....	863.96
	<hr/> \$231,916.89

Liabilities—None.

Losses paid since organization, four years \$115,529.43

THE FLOUR MILL EXPLOSION AT WURZEN.

On the 1st of March last, an explosion of flour took place in the steam mill of Mr. G. Schoenert, at Wurzen, Germany, which ranks next to the memorable explosion in the Tradestone Mills, Glasgow, in 1871, and the one in 1878, in Minneapolis, by which latter five large mills were destroyed. Dr. H. Sellneck, president of the Saxon Millers' Association, writes that he was invited by the proprietor to examine the ruins on the afternoon of the day on which the explosion occurred, and he gives the following details of what he saw: The ground floor and the two next floors of the principal building were in ruins; the walls of the upper story were also entirely destroyed, as well as three sides of the second story. Iron girders and iron columns were twisted in all directions; the outer buildings and the boiler-house were likewise broken down, and the party walls destroyed. Thirty feet from the scene of the explosion a carriage was found entirely destroyed by the debris, which the force of the explosion had hurled this distance. The appearance of the building, with its partially demolished roof, dislocated and twisted girders, bent worms, and blackened walls, was heartrending, and the curious might well ask, were all these things caused by flour? With the exception of several windows, the mill, in which there were 12 pairs of stones, a number of roller mills, and purifying and dressing machinery, had not suffered; nevertheless, the explosion caused immense agitation amongst the workmen, of whom 14 were injured, but none seriously.

The Inspector of Factories, Mr. Morgenstern, who had been informed of the circumstances, accompanied me in my voyage of inspection. Examined more closely, we found that the building destroyed was about 5 metres by 9 metres, and divided in two by the floors; half had been used as a warehouse, and the other half as a flour mixing chamber; it was in this latter chamber where the explosion occurred. Situated on the first floor, there was the hopper above the mixing machine, and below a place for depositing the sacks. The flour mixing machine was established on a platform, and the action of the machine was to thoroughly mix the flour by rotating beaters. The mixing chamber was entirely closed and dark, without windows, and only accessible by means of a trap (?) door; light was obtained from a naked gas jet night and day. When the mixing machine was put to work the doors of the chamber were closed, and the workmen could only enter the chamber to fill the sacks

when the mixing was finished, and the flour and dust had been deposited. Flour mixing had been carried on under these conditions perhaps thousands of times. On this occasion, however, it would appear that the door of the chamber was not closed, so that as soon as the machine was put in motion, the flour dust quickly spread about and soon reached the gas jet, the explosion at once occurring. This view is confirmed by the circumstance that the force of the explosion was most severe just above the door in question. The conjecture that a spark could have come down the chimney in the chamber and caused the explosion is not reasonable, for flour will not ignite from contact with a spark, which has been proved by Professor Weber. The direct cause was a clear flame from the gas; the burnt flour found on the floors, and the carbonised walls prove this. The flour itself was Rye flour, which is of a nature to catch fire easily and quickly. The building, fortunately, was a lightly erected one; had the walls been very thick, the destruction and damage would have been greater still. The explosion should teach us to always place the flour mixing chamber, as well as the dust chamber, outside the mill building, in a light, separate building; moreover, this disaster shows anew very strongly that open gas jets are very dangerous. Millers generally admit any cause of these explosions except the true one, viz: that flour will burn and explode like powder, when it is properly divided and mixed with air.

THINGS WORTH KNOWING.

Lemons will keep good for months by simply putting them into a jug of buttermilk, changing the buttermilk about every three weeks. When the lemons are required for use they should be well dried with a cloth.

One of the best disinfectants is a high degree of cleanliness. Save fire, there is no disinfectant besides this that is perfect in its action. If not thorough, disinfectants are almost useless. Many only narcotize disease germs, but do not destroy them.

A good and very old plan for preserving eggs is as follows: To each pail of water add two pints of fresh-slaked lime and one pint of common salt; mix well, fill a barrel half full of this fluid, put the eggs down in it any time after June, and they will keep for many months.

Harness dressing: One gallon of neatsfoot oil, two pounds of beeswax, four pounds of beef tallow; put the above in a pan over a moderate fire. When thoroughly dissolved add two quarts of castor oil; then, while on the fire, stir in one ounce of lampblack. Mix well, strain through a fine cloth to remove the sediment, and let cool.

One tablespoonful of ground brown mustard seed, mixed with two tablespoonfuls of lukewarm water, will make a very efficient plaster. Lay this between well-worn muslin and fold the edges, that the linen of the bed or person may not be soiled. A little molasses will prevent blistering.

One need have no more "crow-feet" at 40 than at 14 if people would laugh with their faces. But the crow's-feet are increased tenfold by burying the face in pillows at night. A looking-glass will prove this at any time.

Wrinkles on the forehead are similarly invited, and with the crows' feet, can be sent away at any time.

Dry salt applied every day and brushed into the roots will make the hair silky and cause it to grow. Do not continue but a year, or two at longest, as it is a strong tonic.

Velvet wears better if brushed with a hat brush, by pressing down into the nap and then turning the brush as on an axis, to flit out the lint. Do not brush backward or forward.

Cut jewels should never be wiped after washing. Wash carefully with brush and castile soapsuds; rinse and lay face down, deep into fine sawdust until dry; boxwood dust is best.

The best way to apply salt to paths to destroy weeds is as follows: Dissolve the salt in water, one pound to one gallon, and apply the mixture with a watering-pot that has a spreading nose. This will keep weeds and worms away for two or three years. Put one pound to the square yard the first year; afterwards a weaker solution may be applied when required.

The beauty of morocco leather may be quite restored by varnishing with the white of an egg.

To prevent the rusting of steel instruments; take equal parts of carbolic acid and olive oil, and smear over the surface.

A better plan for removing grease-spots than by applying a hot iron is to rub in some spirits of wine with the hand until the grease is brought to powder, and there will be no trace of it. Every schoolboy is not aware that ink-spots can be removed from the leaves of books by using a solution of oxalic acid in water; nor does every housemaid know that "spots" are easily cleaned from varnished furniture by rubbing it with spirits of camphor.

Crape may be renovated by thoroughly brushing all dust from the material, sprinkling with alcohol, and rolling in newspaper, commencing with the paper and crape together, so that the paper may be between every portion of the material. Allow it to remain so until dry.

STRAIGHTENING A LEANING CHIMNEY.—It was discovered upon examination not long ago, that a chimney 80 feet high at Holyoke, Mass., was about 42 inches out of perpendicular. The method employed in righting was quite simple. A harness was located under the corner, and two others below the first. Two lever jackscrews were placed under the girders of one of the harness on one side, and six jackscrews similarly on the other side. The earth was then carefully loosened about the chimney on the opposite side from that of its inclination, and water poured in, after which the jackscrews were turned gradually, and the earth again loosened and dampened with the hose. After this process had been several times repeated the earth was puddled, and the whole stands now properly righted.

THE Philadelphia Record says: One steel manufacturing firm in the west end of the state has just opened coffee houses adjacent to the mill, where hot coffee, rolls, sandwiches, etc., are served up cheap. A pint of coffee, with milk and sugar costs 2 cents; pint of coffee and ham sandwich 5 cents. If such humanitarian sentiments found expression a many of our manufacturing establishments there would be less liquor drinking and physical exhaustion among laborers.

UNITED STATES MILLER.

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OPERATIVE MILLERS ASSOCIATION.

The object of this Association is to unite all practical millers, to give aid to its members, to assist each other to procure employment, to establish a widows' and orphans' fund, and for the advancement of the art and science of milling. The officers of the Association are: Dan J. Foley, President; Tom Stoutenberg, First Vice-President; John T. Gebbie, Second Vice-President; A. Snuggs, Secretary and Treasurer. 821 Howard Street, St. Louis, Mo.; Dan J. Foley, Alex. Frazer, David Pollock, Trustees. Hall at 110 N. Fifth Street, St. Louis.

AUSTRIA will not impose the import duty on grain at present. Sweden has also concluded not to impose import duties on grain.

THE Cincinnati Price Current issued its thirty-sixth, annual report of the provision and grain trade, April 18. It is very comprehensive and merits careful study.

A GREAT many people on each side of the border would like to see a new commercial treaty established between the United States and Canada. A liberal treaty is certainly desirable for both countries.

THE Milwaukee Dust Collector Co. are receiving a great many letters from millers complimenting their handsome new catalogue, and congratulating them upon the great success of their machine.

JERE. ALLIS, the father of Edward P. Allis of Edw. P. Allis & Co., of Milwaukee, died in Franklin, N. Y., April 18, aged ninety-nine years. He retained his mental faculties unimpaired to the last. The remains were brought to Milwaukee for interment.

THE prediction of many that with the incoming of the new administration the country was going to "the demitition bow-wow," does not seem to materialize. The probabilities are that we are to have another straightforward business administration. More business and less politics will tend to advance the prosperity of the country.

No happier definition of the importance of paper to the social commonwealth could, perhaps, be given, than that of the German writer, who describes it as the repertory of all the arts and sciences, the minister of all governments, the broker in all trade and commerce, the second memory of the human mind and the stable pillar of an immortal name.

THE Northwestern Trades Gazette is the title of a very handsome paper published by C. S. Van Duyn & Co. of Milwaukee. The paper circulates very extensively among the dealers of the Northwest, and it is well supported by Milwaukee commercial houses. W. G. Roberts a thorough newspaper man, is responsible in no small degree for the healthy appearance of the Gazette.

WAR AND FINANCE.

The despatches from the leading grain distributing centres show how sharp was the rise in prices, and more especially in the price of wheat, occasioned by the rumor of actual war between Russia and England. Rarely has the evidence of such a flurry been seen unaccompanied by panic and ruin, but the idea has become general that such a war will be of benefit to this country. Men who had long grum-

bled because wheat was selling below one dollar a bushel saw their opportunity and ran up the price seven cents, though much of this was pure speculation, and may not be sustained after the actual facts are known and the resulting influences gauged more accurately.

FREIGHT RATES IN ENGLAND.—One reason why the food supplies of London are obtained so largely from the continent or from this country is that local freights in Great Britain are high. At a meeting of the East Kent Chamber of Agriculture statements were made which evoked bitter comments upon the policy of English railways. A ton of cheese was transported from the United States to London for 25 shillings, while a ton of cheese from Chester to London cost 42 shillings 6 pence. Potatoes from France were transported to London for 30 shillings per ton, while from Penzance the charge was 45 shillings. Hops were transported from Flushing, Holland, for 20 shillings, but from Feversham the charge was 33 shillings. Comparing these British charges with those of which many people complain so bitterly in this country, it will be seen that after all American railroads serve the public at very reasonable rates.

A SHORT WHEAT CROP.

The returns of April to the department of Agriculture indicate a reduction of over 10 per cent. of last year's area in winter wheat. The aggregate shortage amounts to 3,000,000 acres. A decrease is reported in every State except Oregon. It is 22 per cent. in Kansas and Virginia, 20 in Mississippi, 15 in California, 14 in Alabama, 12 in Tennessee, Illinois and Missouri; 11 in New York and North Carolina; 10 in Maryland and Texas; 8 in New Jersey, West Virginia, Kentucky and Indiana; 7 in Georgia and Ohio; 6 in Pennsylvania and Delaware, 5 in Michigan, 3 in Arkansas and 2 in South Carolina. The present condition of wheat, as reported is worse than in 1883. It is 77 per cent. against 96 last year, and 80 in 1883. In 1881, the year of lowest of recent rate of yield, the condition, April 1, was 85, and serious loss was sustained afterward. The real status of the crop will be better shown a month hence, when the vitality of the roots has been demonstrated and the character of the spring determined.

On the present showing the reduction of yield on the basis of last year's production promises to be nearly forty millions bushels on account of reduced area, and more than sixty millions from winter killing and low vitality. Whether the crop will exceed 400,000,000 bushels or fall short of it depends upon the reliability of the present appearances and on future conditions affecting growth and ripening. The soil was in bad condition at the time of seeding on the Atlantic coast from New Jersey to Georgia and in West Virginia and Tennessee. It was better in the Southwest and in Missouri, Illinois and Michigan. In the Ohio Valley it is scarcely in a medium condition. Damages by the Hessian fly were not severe, though worst in Indiana, Illinois, Missouri and Kansas, where injuries have occurred in three-tenths of the reported territory.

The acreage of rye has been decreased in about the same proportion as wheat, but the condition of the crop is decidedly better, the average being 87 per cent.

WAS THIS THE FIRST PASSENGER ELEVATOR?

In a little work entitled "*The Greville Memoirs*," the author, in an account of a visit to Genoa, Italy, in 1880, mentions a passenger elevator as follows:

Called on Madame Durazzo and went with her and her niece, Madame Ferrari, to the King's palace. Like the others, a fine house, full of painting and gilding, and with a terrace of black and white marble commanding a view of the sea. The finest picture is a Paul Veronese of a Magdalen with our Saviour. The King and Queen sleep together, and each side of the royal bed there is an assortment of ivory palms, crucifixes, boxes of holy water and other spiritual guards for their souls. For the comfort of their bodies he has a machine made like a car, which is drawn up by a chain from the bottom to the top of the house; it holds about six people, who can be at pleasure elevated to any story, and at each landing place there is a contrivance to let them in and out!

Certainly this was the precursor of the modern elevator for it possesses all its essential features—much more so than the passenger car used in the torture chamber of the Inquisition in the sixteenth century, which took in passengers, hoisted them up, and then had the habit of letting them out through the bottom and landing them on sharp spikes without consulting them as to when or where they desired to make a landing.

HYDRAULIC TEST FOR BOILERS.

Mr. J. E. Jerrold, foreman of the C. M. & St. P. R. R. Boiler Department in Milwaukee, in a recent communication to our esteemed contemporary, *The American Machinist*, makes the following remarks on the above subject:

There is no risk or responsibility incurred in testing boilers of this size up to 800 pounds, if the material and workmanship are first-class. I have listened to many arguments and objections against subjecting boilers to the hydraulic test as useless and destructive. Having been engaged for the last twenty-five years as foreman of boiler shops, and having made and tested probably over two thousand boilers during that period, some experience and many hard facts have been gained; and I have made several tests with a view of ascertaining the result of high hydraulic pressure test, and have yet to discover any injury that has been inflicted on the boilers so tested when the materials and workmanship were first-class. Of course, boilers can be and are often strained by hydraulic testing, but a close examination will show the true cause. Generally the makers of such boilers are bitterly opposed to hydraulic or any other form of testing.

If builders were fairly paid for their work, and none but the best material and workmanship allowed, testing would only affect poorly-made boilers, and the record of boiler explosions would be greatly diminished. Some years since, the writer recollects the objections that were urged against iron railway bridges, in consequence of accidents that were traced to the use of poor material used in construction. The manufacturers saw the mistake, and applied a remedy—a rigid system of testing and inspection of all material subjected to strain.

In conclusion I will say there is no mystery connected with boiler explosions. The causes are poor material, poor workmanship, incompetent examinations and carelessness.

GREAT BRITAIN AS A GRAIN CARRIER.—The marked supremacy of Great Britain as a grain carrier over the other countries of the

world is strikingly brought out in a statement just published, giving the extent of the grain exports from New York in 1884. For the twelve months ending in December last, we find that there were 45,393,787 bushels of grain shipped from New York. Large as this quantity is, it was the lowest for any of the past five years, and for comparison the figures may be given:—1880, 118,343,468 bushels; 1881, 72,276,312 bushels; 1882, 49,162,738 bushels; 1883, 48,457,945 bushels; 1884, as already stated, 45,393,787 bushels. In the transport of the last-named quantity 1,221 vessels were engaged—1,120 steam and 101 sail. Of the total amount shipped last year, the flag of the United Kingdom carried 25,177,009 bushels in 661 vessels, as against 20,216,778 bushels by other nations in 557 vessels. American vessels only participated to the extent of 69,354 in two sailing vessels. Next to Great Britain as a carrier comes Germany, with 6,442,330 bushels and 216 vessels; then Belgium, with 5,074,778 bushels and 73 vessels; France being fourth in the list, with 2,283,770 bushels and 65 vessels. Russia, of all the European countries, took no American grain last year. An interesting fact brought out in the statistics is the great displacement in this trade of sail by steam carriers. America and Austria had no steamers engaged in this trade from New York in 1884, and Italy and Portugal still did the large bulk of their share of the trade by means of sailing ships; but Great Britain and the other European States have almost wholly supplanted sail by steam. In fact, there were no Belgian, Danish, Dutch, or Spanish sailers engaged in the trade last year. Great Britain sent only three sailing vessels to New York for grain, and these in the aggregate carried only 143,167 bushels, showing a little over half of one per cent. carried by her sail in 1883. In 1880 sail tonnage was predominant, no less than 68,376,584 bushels being transported in that year, as against 49,966,579 bushels by steam. In 1881 there was an abundance of steam freight, for grain by sail ran down by comparison with the previous year to less than 30 per cent., and in 1884 but 2,431,988 bushels were carried in sail bottoms by all nationalities. The changes of the last five years from sail to steam are shown in the following table:

Year.	Steam. Bushels.	Sail. Bushels.
1880.....	49,966,579	68,376,584
1881.....	53,355,728	19,020,588
1882.....	39,343,449	6,284,289
1883.....	44,105,009	4,252,986
1884.....	42,561,799	2,431,988

The total shipment of wheat for the year was 28,102,185; corn, 9,798,819; rye, 4,945,266; oats, 2,482,196; and barley, 65,321 bushels.—*Leeds Mercury*, (England.)

THE Geo. T. Smith Middlings Purifier Co. are building an elegant and convenient Pavilion to be sent to Antwerp, to be used as their office at the Miller's Exposition to be held there the coming season. It is made of the various woods used in constructing their purifiers, and will be a most unique and attractive affair. Our Octopus-ian friend, W. M. Clark, will spread his tentacles, all over and through it, and gather in all the glory and business it will hold. It will be a fine specimen of American enterprise and business.—*Southern Miller*.

MARINE STEEL BOILER.

*Experiences in the use of thick Steel Boiler Plates.**

By Mr. W. PARKER.

An ordinary cylindrical boiler 13 ft. in diameter and 16 ft. long, designed for a pressure of 150 lb. per square inch, for which the scantlings were amply sufficient, burst under the hydraulic pressure. The pressure was applied very carefully, and when it had reached 240 lb. the fracture occurred, extending completely across one of the shell plates, and to a slight extent also into the adjoining plate.

The boiler was constructed entirely of steel made on the Siemens-Martin process by a firm who enjoy the reputation of producing a material second to none in the country.

The plates were all tested at the steel works and fulfilled the requirements of both Lloyd's Register and the Board of Trade.

I find from our surveyor's report that the sample from the particular plate which failed—which was 1½ in. thick—stood a tensile strain of 29.6 tons per square inch with an elongation of 20 per cent. in a length of about 8 in., whilst strips cut from it were bent almost double, cold. In fact the material appeared, from the mechanical tests applied before it left the steel works, to be in every respect suitable for the purpose for which it was intended.

One remark, however, may here be made, namely, that the plate in question was exceptionally large and heavy, viz., 20 ft. long, ft. 5 6 in. wide, and 1½ in. thick, weighing about 2 tons 16 cwt.

This material was built up into a boiler by a company who have had an unusually extensive experience in the manipulation of steel, having turned out no fewer than 175 boilers of this material.

The plates were treated precisely as other steel plates have been treated in the same works, and with all the appliances which experience has shown to be necessary, all the holes were drilled, and the plates were then heated in a furnace and bent to the required curvature in a pair of powerful vertical rolls in the usual manner.

Under these circumstances it appeared at first sight astounding to find the material tearing under a pressure which represents a strain of 6.7 tons per square inch only, or less than one-fourth of the strain which the original sample withstood. In addition to this the appearance of the fracture indicates that the plate did not possess any ductility, stretch, or elongation whatever.

Neither the steelmakers nor the boilermaker have as yet afforded any satisfactory explanation of the occurrence.

It is without doubt a most serious affair, especially in view of the high pressures which have now become so common.

On hearing of this accident, the Committee of Lloyd's Register instructed me to investigate the matter, endeavor to ascertain the cause of the accident, and, if possible, recommend some measure to prevent such an occurrence in the future. My investigations were only completed last Tuesday, and as such a serious matter as this, which bears upon the safety of life and property at sea, must naturally give rise to no little specula-

*Read at the twenty-sixth session of the Institution of Naval Architects in London, England.

tion amongst engineers and steelmakers, and has already produced great consternation in many quarters, I have taken this opportunity of laying before you a short statement of the facts as they have come before me, the results of my investigations, and the conclusion which I have arrived at, with a view to eliciting from the various steelmakers and steel users here the benefit of their views and experience.

Upon my visit to the boilermaking works I was fortunate enough in finding a sister boiler to the one which had burst; ready for testing.

This boiler was tested in my presence to 300 lbs. per square inch, and was carefully measured and gauged and found to show no signs of deflection or yielding.

I also ascertained from an examination of the testing appliances that an abnormal pressure could not possibly have been exerted at the time of the testing of the first boiler.

Seeing that the plates that broke had stood all the mechanical tests required, before leaving the steel works, and that when worked into the form of a boiler shell it gave way at less than one-fourth of its original strength, it appeared at first sight that the plates had been in some way injured, or had undergone some material change from the time they left the steel works until they were rivetted into the form of a boiler shell; therefore it became necessary to look carefully into the mode of manipulation of the plates in the boiler shop and especially the heating and bending of them.

One of the plates was bent in my presence. It was heated in an ordinary plate furnace, but when taken out was far from being of a uniform heat; the end of the plate near the door of the furnace was at a black heat, which gradually increased towards the other end to a dark red heat. Then the plate was turned end for end and again placed in the furnace with a view to heating it as far as possible uniformly, but when again drawn out of the furnace it was seen that the heat was not at all uniform, one end being of a dark red or nearly black heat, which gradually cooled down to a blue heat at the other end.

In this condition it was passed through a set of powerful vertical rolls, and bent to the required curvature. The plate passed through these rolls six times, and by the time the operation was completed one end of the plate was quite cold, when the other end remained at a blue heat.

It was thought that this unequal heating of the plate may have set up in the body of the plate excessive strains of a dangerous character, and that these strains were aggravated by rolling the plate at a dangerous heat, it being well known that all steel becomes brittle when worked at a blue heat, and it is, I think, generally admitted that it is far safer to work steel cold, or red hot, than at any heat between these two points. Steel plates, and especially large ones, must be injured by such treatment, but as to the intensity of the strains set up, or their exact locality nothing definitely can be said, to ascertain the nature of the material as it stood. Test pieces were cut from the fractured plate, both close to the fracture and apart from it, and subjected to tensile test at one of Lloyd's proving houses, with the following results, which the engineers have kindly communicated to me.

Sample.	Breadth.	Thickness.	Area.	Total Tons.	Square Inch.	Extension in 8 in.	Extension in inches.	Contracted Area.
1. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
2. C	17	1.26	40.5	40.5	40.5	27.34	27.34	
3. H	17	1.26	40.5	40.5	40.5	27.34	27.34	
4. H	17	1.26	40.5	40.5	40.5	27.34	27.34	
5. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
6. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
7. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
8. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
9. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
10. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
11. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
12. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
13. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
14. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
15. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
16. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
17. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
18. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
19. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
20. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
21. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
22. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
23. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
24. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
25. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
26. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
27. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
28. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
29. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
30. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
31. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
32. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
33. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
34. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
35. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
36. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
37. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
38. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
39. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
40. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
41. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
42. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
43. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
44. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
45. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
46. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
47. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
48. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
49. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
50. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
51. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
52. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
53. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
54. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
55. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
56. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
57. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
58. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
59. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
60. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
61. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
62. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
63. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
64. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
65. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
66. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
67. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
68. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
69. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
70. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
71. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
72. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
73. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
74. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
75. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
76. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
77. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
78. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
79. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
80. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
81. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
82. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
83. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
84. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
85. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
86. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
87. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
88. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
89. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
90. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
91. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
92. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
93. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
94. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
95. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
96. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
97. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
98. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
99. X	17	1.26	40.5	40.5	40.5	27.34	27.34	
100. X	17	1.26	40.5	40.5	40.5	27.34	27.34	

From these tests it appears that the proved tenacity of the plate ranges from 29.5 tons to 33.1 tons, while the elongation stands at from 28.8 per cent. to 28.1 per cent, in a length of 8 in.

I may say that I corroborated these tests by others made from the same plate for my own information in London, and they were also corroborated by other tests made for the information of the steelmakers.

This range of from about 4 tons in the tensile strength of a plate of homogeneous metal like mild steel is very unsatisfactory.

I obtained samples of the plate, and submitted them to five eminent and independent metallurgists, who have kindly furnish me with the results or their chemical analyses, which are as follows:

Carbon.	Silicon.	Sulphur.	Phosph.	Manganese.
.36	.015	.055	.087	1.05
.37	.016	.044	.076	.641
.33	.010	.068	.065	.612
.30	.018	.044	.068	.648
.26	.005	.068	.067	.650

The most striking feature in these analyses is the large proportion of carbon shown to exist in the plate. It is particularly high for boiler plates. Material used for thin plates, say, from $\frac{1}{4}$ in. to $\frac{1}{2}$ in. thick, to stand the same mechanical tests as these thick plates did, would not contain more than from .15 to .18 of carbon; and this fact led us to further experiments.

In view of the great difference in carbon between a thick plate and a thin one to stand the same mechanical tests, it was deemed desirable to make an experiment which would determine to what extent work in the shape of rolling, and especially rolling thin plates, which during the latter part of the operation must of necessity be rolled, comparatively speaking, cold, affected the tenacity and ductility of the material. A slab of steel containing about the same amount of carbon as the plate that ruptured, viz. .33, was obtained at the steel works where the plate was made, and rolled at one heat down to $\frac{1}{4}$ in. in thickness. This material, had it been rolled down to $\frac{1}{2}$ in. plate, judging from the carbon it contained and the tests of the broken plate, as well as the opinion of the steel makers, would have had a tenacity of from 30 to 34 tons per square inch. It was found, however, that when rolled down $\frac{1}{4}$ in. thick its tenacity was

increased to from 35 to 41 tons per square in., with an elongation of from 21 to 24 per cent. in a length of 8 in. Other pieces were made hot and quenched in water. These, when tested broke at a tenacity of from 44 to 46 tons, and had, practically speaking, no stretch at all.

Pieces were cut from the fractured edge of the plate, and subjected to tensile, bending, and temper tests. They showed a tenacity of 33.5 to 34.2 tons per square inch, but they stretched 18 and 16 per cent., and broke with a crystalline and apparently brittle fracture, as will be seen by the specimens produced. They bent cold to a considerable degree, but when made red hot and quenched in water, instead of bending, as pieces of a thin plate of similar tenacity and ductility would do, they broke under the first blow of a hammer without any bending whatever. The material was so high in carbon as to take a temper and become quite hard and brittle.

Further cold bending tests were made from pieces of the broken plate, both before and after being annealed: those which were tested before annealing bent fairly well, strips $\frac{1}{2}$ in. square bent to an angle of 49 deg. and 61 deg., as will be seen by the specimens, the fracture showing a considerable amount of alteration in form, while those pieces which were tested after annealing bent much better—in fact, almost double. Strips, however, that were heated and quenched in water broke short without any bend whatever at the first blow of a hammer, and thus corroborated the previous experiments made in London before referred to.

These experiments point to the fact that the plate which gave way must have become partially tempered by the heating and cooling to which it was subjected for the purpose of rolling it into its cylindrical form.

Having thus placed before you the nature of this accident, and the steps taken with the view of unraveling the supposed mystery, I now venture to state what inferences may, in my opinion, be drawn from the results of the investigation.

I think it will be acknowledged that a material which is so high in carbon as to take a temper and break short, as described, even if it possesses high qualities of tenacity and ductility before being tempered, must be looked upon as unreliable and altogether unsuitable for use in marine boilers.

It would appear that the desire to obtain high steam pressures, and to use steel of a higher tenacity consistent with a large amount of ductility, has caused the marine engineering world to unknowingly drift into using a material of a most unreliable and unsuitable character for the shells of marine boilers, more especially when the usage which such plates received in heating and bending is considered, for, except amongst steel-makers, it does not appear to have been generally known that the thicker a plate is, the more brittle and erratic in its behavior it must become, as compared with a thin plate made to stand the same mechanical tests as far as tenacity and ductility are concerned, as otherwise, that the increase in tenacity from 29 to 32 tons for thick boiler shells would not have been advocated.

So far as I am concerned, and the society which I represent, I may say that it has always been our endeavor to discourage the use of high steel. The rules of Lloyd's Register require boiler plates to have a tensile strength

of 28 to 30 tons, and have done this from the commencement of the use of steel, because we felt that the higher the tenacity arrived at, the more likelihood there would be of the plates giving trouble, and our whole desire has been to keep the material mild. We have, however, had considerable pressure brought upon us by manufacturers and engineers, to allow a strength of 32 tons per square inch.

This accident and the investigations which have followed, clearly point out that engineers have been drifting towards the use of unreliable material which is too near the verge of danger to be pleasant, a state of things that should not exist with steam boilers.

I would therefore urge, in order to remedy this growing evil, that the tenacity of steel plates for boiler shells, which are becoming thicker every day, should in no case exceed 30 tons; and that the practice of using enormously large plates should be discouraged; while more care should be exercised in uniformly heating and bending these plates.

I have conferred with the principal steel-makers in the kingdom on this subject, and am able to say that they agree with me, and are decidedly of opinion that steel plates more than 1 inch in thickness, and having a tenacity of more than 30 tons, must contain so much carbon as to render them unsuitable for boiler-making purposes; although they may possess the necessary tenacity and ductility to withstand the usual tensile and cold-bending tests.

I venture to hope that this paper will be made the subject of a discussion, with a view to obtaining further opinions respecting the important points in question.

MACARONI.

Though we may not all go into ecstasies over macaroni, it is a positive fact that but very few people who have once tasted this peculiar preparation ever discontinue its use. But there are different qualities, and much depends not only upon the materials employed but upon the methods of manufacture, and also upon the manner in which it is prepared. The proper way to cook macaroni—so says an eminent Italian chief—is to take a quarter of a pound of macaroni and sufficient water to cover; the water must be boiling before the macaroni is put in, and must be kept so while cooking for twenty minutes, stirring occasionally. Salt to suit the taste, strain, and serve with tomato sauce or gravy and grated cheese.

The word macaroni is taken from the dialectic Italian *maccare*, "to bruise or crush." The article is a preparation of wheat originally peculiar to Italy, where it is an article of food of national importance. Different forms of the same substance are known as vermicelli, pasta or Italian paste, taglioni, fanti, etc. These are all prepared from the hard, semi-translucent varieties of wheat which are largely cultivated in the south of Europe, and known by the Italians as *grano duro*. These wheats are much richer in gluten and other nitrogenous compounds than the soft or tender wheats, and their preparations are more easily preserved, which makes them more suitable for these pastes. They are made in various fanciful forms in a uniform manner, from a granular meal commercially known as *semolina*. This semolina being thoroughly mixed into a stiff brown

paste with hot water, is forced by a powerful plunger through the perforated head of a cylinder into the various forms required. After this the product is dried rapidly by hanging up in long sticks or tubes over wooden rods in heated apartments, through which currents of air are driven. It is only genuine macaroni, rich in gluten, which can be dried in this way; the spurious made of poor flour and colored artificially, will not hold together. Hence, when we find macaroni which shows that it has been dried in the described manner, we are sure of its genuineness. True macaroni shows the mark of the flattened rods over which they have been hung to dry, are never mouldy on the inner side, and do not crack or split as do the imitation, which have been laid out flat to dry. It has a soft yellowish color, is rough in texture, elastic and hard, and breaks with a smooth glassy fracture. In boiling it swells up to twice its original size without becoming pasty or adhesive, maintaining always its original tubular form without either rupture or collapse. It can be kept any length of time without alteration or deterioration, and is a most nutritious and healthful article of food. Many imitations are made in France, Germany and the United States, the best of which are made of common flour, enriched by the addition of gluten.

LATEST FROM THE INVENTOR OF THE KEELY MOTOR.

John W. Keely to-day told a reporter of his latest discovery. As he related the narrative the discoverer's eyes sparkled and a beam of satisfaction spread over his face when he remarked: "I have at last attained the work of my life. I have discovered the power which for years I sought, and I feel perfectly satisfied now that my discoveries and inventions can go forth to the world." For six months I have worked fourteen and eighteen hours a day. The world saw little of me because I was locked up in my workshop. My new engine is operated upon an entirely different system from anything I ever used before. It will be known as the rotary etheric engine. The power is obtained from inter-atomic air, or, rather, luminiferous ether. In fact, I have half a dozen terms to apply to it. This new power is under complete control, and is greater by five or six times than gunpowder. Indeed, by multiplied concentration I can make it fifteen times greater. In a recent experiment I obtained 22,800 pounds of pressure to the square inch in eight seconds. No water is used in this engine or to secure this power, air alone being the agent. The introductory receptacle, which holds one-half pint of air, required sixty pounds of steel in its construction. I expect (but can not state for a certainty) to give an exhibition in three weeks. This will depend entirely upon the machinists. If they disappoint me, I can not tell when it will happen. Next month I will have a perfect engine completed. It will not weigh more than three tons, and will be equal to five hundred horse-power. The apparatus which is used in connection with the engine is named the "Liberator."

"How about the Keely Motor company?"

It has no interest in the new engine and discovery. A company is to be formed, but I should hardly give the particulars. It will have a capital of \$12,000,000, and it is likely that the shares of the Keely Motor company will be exchanged for those of the new. I

will have the controlling interest. The Keely Motor company has not paid me a penny for two years, and all these new discoveries and inventions have been paid for out of my own pocket. To return again to the original subject, I believe that five liberators and engines can supply all the power needed in this city. This power can be stored in tubes and transported anywhere. In about six months, or sooner if possible, I will take out the patents in this country, and then I shall go to Europe, where I desire to exhibit my vibratory lift, the sympathetic lift, and several other inventions which the public do not know of."—*Philadelphia Cor. St. Louis Globe-Democrat*.

THE KANSAS CORN CROP.

The large growth in the live stock interest has resulted in the retention of a much larger proportion than usual of the corn crop. The low prices have had much to do in keeping the product at home, and but a small proportion will ever be sold out of the country in which it was grown. In 1884 the 5 per cent. of the crop that was called "unmerchantable" was moldy corn, not soft corn. This was occasioned by continued wet weather in the late summer and early fall. There are no reports of injury to the condition of cattle or losses from eating this moldy corn, although many instances of loss are again reported from turning stock into "stalk fields" where there was an insufficient supply of water.

The average amount of sound corn for a series of years in Kansas, as reported by correspondents is the same this year as last—84 per cent. The proportion of the crops of 1884 that was sound was larger than that of the previous year, being 95 per cent. The corn crop of 1884 was not only the largest in the history of the State but was of a better quality than ever before. The average price per bushel, however, of the crop remaining on hand is much less than at this time one year ago, being 27 cents per bushel for sound and 18 cents for unsound. This low price has prevailed since the fall of 1884, and as a result a much larger per cent. than usual yet remains in the field, this proportion being 18 per cent. For the first time in several seasons the western counties harvested a fair crop, and much preparation is being made in consequence to put an increased area this year, and a large addition has been made to the numbers of cattle and hogs.—*Kansas City Price Current*.

BOOK NOTICE.

We have received from Aug. Helme, the well-known manufacturer and bolting-cloth dealer of Silver Creek, N. Y., copies of his memorandum book for 1885. Millers will be furnished copies free upon application.

FORMULA FOR GELATINE PAD.—The French Ministry of Public Works publishes a formula for a hectograph or gelatine pad, which is said to produce very satisfactory results. The composition consists of 100 parts of good ordinary glue, 500 parts of glycerine, 25 parts of finely powdered baric sulphate, or the same amount of kaolin and 875 parts of water. For the copying ink a concentrated solution of Paris violet aniline is recommended. To remove the old copy from the pad, a little muriatic acid is added to the water, washing it gently with this liquid by means of a soft rag, afterwards using blotting paper for removing superfluous moisture.

WHAT OUR MILLING EXCHANGES SAY.

WHY MILLS BURN.—The insurance man vaguely hints that the friction of a policy on unproductive property is one of the chief causes of mill fires. The nervous, but ill-informed alarmist traces everything to dust explosions and spontaneous combustion; though just how dust explosions can occur in mills that have been idle for several hours, or maybe a day or a week, is not explained.

Undoubtedly there are some mills that are directly fired by their owners to get their money out of a bad piece of property. Millers are no better or no worse than the average of mankind; and it would be strange if some few of them were not unprincipled enough to sell their mills in this way. But the greatest moral hazard connected with unproductive mills is not incendiarism by their owners, but the neglect which their unproductive character engenders. They are not kept clean. They are not watched, and if untenanted or idle for the time being, no one is at hand to fight the flames when they make their appearance. Comparatively few mills take fire and are completely consumed when running night and day, for the simple reason that some one is always present in such cases, and incipient fires are promptly detected and extinguished. The majority of mill fires break out after the mill has shut down, in time dating from an hour to a day or so; but usually in the early morning following the night the mill shut down. Mill fires on Sunday morning are numerous.

The explanation of all this is simply that the fire was in progress when the mill shut down—we mean when the time is limited to 24 or 48 hours. When the mill shut down, the fire might have been slowly burning in an elevator-head, a conveyor-box, in a fan-box, or some hot bearing may have already started a slow fire. Sparks of fire may have smoldered in out of the way places. In cases where the mill has been idle for several days or longer, spontaneous combustion is a very possible cause; for the elements of such a fire are present in most mills.

Millers and underwriters are gradually getting at the true causes of mill fires, and with a growth in the knowledge of the causes we may look for a decrease in the number of these mysterious fires. Close attention to the machinery, cleanliness in the mill, and avoiding placing machinery in inaccessible or out of the way places, where employees are apt to neglect it, are among the precepts which should be followed by every mill-owner, and which, if followed, will often prevent disastrous fires, and save the necessity of the rascally adjuster's services.—*American Miller*.

ECONOMY IN POWER.—To save power is to save money in running expenses. See that all shafting is kept in line, all bearings adjusted exactly right and no binding anywhere. We remember once where a shaft from the turbine came through a stuffing box on the decked flume. The wheel did not appear to give enough power. By loosening up the packing in the stuffing box we had one-half more power to use. Packing around the rods of an engine can be too tight, so as to greatly retard the engine's work. It pays to use the best oils for all bearings.

If we have some small pulley from which much power is taken, we are liable to lose power by the belt slipping. It will always

pay to cover such pulley with leather, if it does cost something. We are sure very soon to save its cost in power and belt.

A handy arrangement to show if elevators are surely running, is to make a slot through the front of the elevator spout, and insert a strip of heavy leather, like belt leather. Have it project inside far enough for each passing elevator cup to hit it, and project outside so that the miller will readily notice the vibration caused by the knocking of the inside end. A habit of watching the projecting leather will give sure notice when the elevator is choked.—*From the Millers' Review for April*.

NASHVILLE NOTES.—At last the cold weather is passing away, and to our appreciation comes the balmy air and bright spring time. How very intense the piercing wintry air, and how prolonged it seems the season has been. Each one of our population seems heartily tired of its severity, and joyfully welcomes the approach of spring, however tardy it may have been in its arrival. As the season of spring has come to stay, the general appearance of the growing cereal crop can be more definitely seen and calculated upon; and as we before said, the prospect for a wheat crop is very far from flattering; in fact, all reports, however blue they might have been, cannot exaggerate the very unsatisfactory situation of that particular cereal.

In conversation with those who are engaged extensively in raising wheat, and who, too, have traveled extensively over a very large area of country, the general report is that there will not be to exceed one-fifth of the crop of last year.

Although in some few places the stand seems fair and somewhat encouraging, yet those positions are very few indeed, and the universal tone of the mass of farmers, with very few exceptions, echo the reports just enumerated, and to say that this particular community is blue is drawing it very mild indeed.

The severity of the winter and its effect upon the wheat plant has caused the farmers to note perceptibly the modes employed in planting. It is very obvious to observers which style of planting withstands the severe winters in the southern latitudes. As is known, there are several modes employed, broadcast by hand, broadcast by drill, and planting with the hoe drill. It is very generally conceded by the farming community, that wheat planted by means of the hoe drill has stood the test very much better than either of the other modes employed.

The hoe drill as it plants the grain has a general tendency to well cover the berry, and places it beyond all immediate danger from, at least, light wintry weather, and even a severe one, as has just passed; and as the freezing and thawing takes place, although the grain is being raised upward continually, still it being so well sheltered, and the roots so well advanced deeply in the earth; it adheres tenaciously to the soil, and is not induced to release its hold until a very severe spell of cold weather prevails, with the ever-changing temperature of this changeable climate.

Not so with the broadcast grain either way it might have been sown. The grain is embedded so shallow that the action of the changes in the weather completely raises the blade conspicuously out of the ground, even, as it were, setting each blade upon a little

knoll of earth, the which, on being continued, gradually strains the slender root until, at last, it is cut off and fades.

Undoubtedly the makers of the different kinds of drills will note the changes necessary for the peculiar climates their several machines have to labor in, and act accordingly, for the successful operation of them under climatic influences.

Respecting the operations of the several mills in and around the city, not very much change can be noted from that of last month. Business, if anything, has become more dull, and those mills reported on half time then still continue about the same turnout. Flour has become a drug, and the tendency is to stock up some, even running part time. It is possible, however, by the impetus received at some of the mills in the shape of some decent orders in the thousands, that the next report will be more cheerful. The New Era is among the last named, and the boys there-of are happy.

By the approach of good weather and good roads it is to be hoped that business will brighten some, and it is now generally thought that prices will hold good in view of the unfavorable crop reports.

Some little is being done in mill overhauling, mostly in small plants, however. Messrs. Shelton & Jordan, at Triune, are putting in a full roller equipment for a 75-barrels mill, and have entrusted the arrangement of the plans and selection and setting of the needful machinery to Mr. John Metherell, Superintendent at the New Era Mill, of this city.

Several other small plants are now occupying his attention in the shape of diagrams and preparations for future remodeling. Judging from inquiries he receives in this direction the southern small millers are beginning to awaken to the matter of improvement.

The corn meal mill spoken of in a late number, has not yet been settled on. All that can now be said is that it will be built at no very late day, some machinery for the purpose, I learn being already purchased. But the general contract, although under consideration, has not, as yet, been awarded.

I would mention here, that some of our anxious ones have been daily perusing the morning papers relative to the English-Russian probable war. But as each morning's news seems to grow more beautifully less in the shape of war and relative high prices for flour, the expectations have settled down somewhat, and thoughts plod along again in the same old rut of competition and small margins, and for a while at least, the hordes of the world's vast population will continue to exist, although those who judge wisely of the world's crowded condition argue and say

That the World's condition would take a new stand, if war and pestilence scourged the land.

—By "Rock City" in the Southern Miller.

TAKE WARNING.—The startling fluctuations in values shown on the grain board, the present week, demonstrates that prices built upon foreign war news are unstable as water, and dangerously quicksandy. For three weeks we have urged the utmost caution in making deals, the possible profit from which was contingent upon actual war between England and Russia. The issues involved, and the results to accrue from an actual conflict between these two great powers across the sea, are of too great magnitude to admit of a hasty resort to the arbitrament of the

sword, however unctuous the occasion may appear. That a crisis exists there, is sufficiently clear, but an open declaration of war is little more probable or nearer at hand now than it appeared a full month ago. Besides, there is nothing in a fully waged conflict to warrant this country in going outside the safe paths of straightforward, legitimate business. Speculation, always dangerous, becomes additionally so when it has no better basis for indulgence than a war between two powers but inconsiderably dependent upon outsiders for supplies. Russia is too poor to fight if she can avoid it decently, and England is so fully occupied in maintaining her supremacy in her colonial possessions, by the steady menace of armed forces, she could scarcely afford to withdraw for concentration, as would be necessary in waging war with so formidable an adversary as Russia. So she won't fight, if bluffing can be made effective.

The United States, now just emerging from a period of disastrous depression, is in no condition to have her agricultural and industrial interests wrought up and distracted by foreign complications, which, if everybody attends legitimately to business, might be turned to account. Just now, however, the best thing is close attention to home affairs, and the pursuit of strictly legitimate business upon tried and approved business principles.—*St. Louis Miller.*

RECENTLY we heard the report of another invention designed to utilize the current of a river without costly dams and wings and foundations; the power generated to be transmitted by electricity to any distance. Now if ever there was a place where such an invention would ensure a fortune to its owner, that place is Buffalo, with a stretch of five miles river front where the current seldom falls below five, and often runs above eight miles an hour, winter and summer, carrying about 20,000,000 cubic feet of water per minute down to Lake Ontario. Who could wish for a better working field to test the value of such an invention? Trot it out, gentlemen, whoever controls it; trot it out here and prove to the world the truth of your statements, and you will receive all the encouragement at the hands of our citizens that you desire. Don't be afraid that you will generate too much power so that you don't know what to do with the surplus. First demonstrate that you can utilize the current and the rest will take care of itself.—*Milling World, April 20.*

WHY THEY FAIL.

It cannot be denied that not a few millers, after adopting the roller system, have failed to do a profitable business. Some have been compelled to assign, others have sold out their business at a sacrifice, while others have, by dint of desperate struggling, been able to keep their heads above water. Those adherents of the millstone system who spend much of their time in vainly seeking for a valid objection to improved methods have of course made the most of this fact, and bring the charge of inherent unprofitableness against rolls and the system of which they are a part.

Now the fact is that it is no more just to blame the roller system in general for individual failures, than to attribute the poor

quality of an editor's effusions to the make of pencil which he uses. Yet it is undoubtedly true that in some cases a miller who was doing a good business and making a fair profit with burrs has been unable to keep up after changing to the roller system. How is this to be accounted for?

Not by attributing it to the rolls, surely; for hundreds of prosperous roller mills all over the country bear witness to the money-making qualities of that system. In fact, there is no one reason which can be universally applied. The causes which lead to these failures are various and widely different. Some of these we will briefly.

The cause of a roller-mill's non-success may be in the inability of the miller to handle the roller system. The man who was entirely competent to run a burr mill finds himself in strange territory when he tackles the gradual reduction system, and it is not surprising that he frequently gets lost if he has no guide. The best roller mill is no good commercially unless it has a well-posted man at the helm.

Or the location of the mill and the class of its patronage may be such that the increased cost of a full roller-plant was not warranted. The conditions may be such that an increased income to compensate for the necessary outlay cannot in any way be secured. The local market will not support a first-class mill and outside markets cannot readily be reached. To this class belong especially small grist-mills, out of reach of the railroads. Their location makes a roller mill unprofitable.

Or the financial condition of the mill-owner may be bad. He sees the roller mills taking away his trade, and no way to compete with them except to adopt their methods. So he goes to a much larger expense than his means warrant, and when his mill starts up is head over heels in debt. This debt is a continual drag upon him, and it is not strange that he often has to give up under the load. Too limited capital has been the cause of many a failure in all branches of business.

Or, in changing the systems, the size of the mill may be increased beyond what the trade will warrant. The temptation is always to put in the greatest possible quantity of machinery and get all the flour possible out of the mill. But where there is only market for fifty barrels it is folly to make a hundred and fifty. A small mill frequently makes a good profit, where a large one would only sink money steadily. The capital that is ample for a 50-barrel mill may prove entirely insufficient for one of four times the size.

Or the mill-owner may not have the business ability to make a success of a roller mill. Especially is this apt to be the case where he has been running a grist-mill all his life, and doing an almost purely custom business. With the roller mill the merchant part of the trade will naturally become more prominent, and he may be unable to run this successfully. A different sort of management is required and this he may not give.

Or the roller mill may not be a roller mill at all. On the strength of a double set of smooth rolls for bran and germ it may blossom out as a complete roller mill and place its products on the market in competition with mills which can justly claim that title. When this is the case it is easy to predict what the end may be.

Or the miller may have attempted to save money by buying the machinery himself and hiring a cheap millwright to put it in position. If this be the case it is usually incorrect to say that the roller system is employed, for the mill has no system at all. It contains some of the machinery belonging to the roller system, jumbled together in any way that was convenient and in such shape that first-class work can not be expected from it. It is not strange that such a mill does not succeed.

Or the mill may have been put up by a "cheap" mill-furnisher, whose alleged system is worse than no system at all. The machines may be poorly constructed, of inferior material, and not enough of them. The reductions may be slighted, the tail of the mill cut short, and the cleaning machinery insufficient. The programme may be bad. All the work may have been slighted. In fact, the mill-furnisher may have done his best not to build a mill that was capable of good work and would be satisfactory and profitable to its owners, but to fill his contract in such a way that he can get the largest possible profit from the job. There are scores of such mills in existence, and all we wonder at is that more of them have not gone under. It is certainly only a question of time when the unlucky possessor of this sort of mill will be obliged to improve it, with the assistance of competent and honest men, or quit the business. The number of genuinely good roller mills is increasing too rapidly to allow permanent prosperity to such miserable botch-work as some flour mills are witnesses of.

These are some of the reasons why roller mills fail. None of them can be traced to any inherent defect of the system. For all of them the poor judgment or incompetency of some person or persons is responsible.

The days of large profits in milling are probably passed. Mills are too numerous and competition too keen to allow of their return. But there are few favorably located, well equipped, well managed roller mills, with a good miller at the helm and a good business man in the office which cannot still make money enough to render it an object.

And, as a class, the roller mills are more prosperous than the burr mills in almost every locality. We assert this unhesitatingly because the facts bear us out. We do not know of a single instance where a burr mill has been able to compete successfully with a high-class roller mill in the hands of competent men.—*The Roller Mill.*

"Young gentlemen," said a lecturer in chemistry, "coal exposed to the elements loses ten per cent. of its weight and power. This is due to the alkali constituents of"—

"But what if there's a dog sleeping near the coal, Professor?"

"None of your levity, young man; this is a serious matter."

"That's what dad thought when 82 per cent. of his coal pile disappeared during three nights of exposure. Then he asked my advice as a student in chemistry, and I told him to buy a dog. He bought a dog with bay-window teeth and the springhalt in his upper lip, and now we don't lose one per cent. of our coal a month. That's the kind of practical chemist I am. Now go on with your theory."

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MILWAUKEE, MAY, 1885.

ANNOUNCEMENT:

WM. DUNHAM, Editor of "The Miller," 69 Mark Lane, and HENRY F. GILLIG & Co., 449 Strand, London, England, are authorized to receive subscriptions for the UNITED STATES MILLER.

We send out monthly a large number of sample copies of the UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. Send us One Dollar in money or stamps, and we will send THE UNITED STATES MILLER to you for one year.

The United States Consuls in various parts of the world who receive this paper, will please oblige the publishers and manufacturers advertising therein, by placing it in their offices, where it can be seen by those parties seeking such information as it may contain. We shall be highly gratified to receive communications for publication from Consuls or Consular Agents everywhere, and we believe that such letters will be read with interest, and will be highly appreciated.

TO ADVERTISERS.

Milwaukee, Wis., April 1, 1885.

To Those Interested in the Flouring Trade:

THE UNITED STATES MILLER is now in its tenth year, and is a thoroughly established and much valued trade paper. It has a large regular list of domestic and foreign subscribers. It is sent monthly to United States Consuls in foreign countries, to be filed in their offices for inspection by visitors. It is on file with the Secretaries of American and European Boards of Trade for inspection of members. Aside from the above, thousands of SAMPLE COPIES are sent out every month to flour mill owners who are not subscribers, for the purpose of inducing them to become regular subscribers, and for the benefit of those advertising in our columns. Every copy is mailed in a separate wrapper. Our editions have not been at any time since January, 1882, less than 5,000 copies each, and are frequently in excess of that (see affidavit below). We honestly believe that the advertising columns of the UNITED STATES MILLER will bring you greater returns in proportion to the amount of money invested than any other milling paper published. Advertisers that have tried our paper for even a few months have invariably expressed themselves well satisfied with the results. Our advertising rates are reasonable. Send for estimates, stating space needed. The subscription price of the paper with premium is One Dollar per year. Sample copy sent free when requested. We respectfully invite you to favor us with your patronage. We shall be pleased to receive copies of your catalogues, and also trades items for publication free of charge. Trusting that we may soon be favored with your orders, we are,

Yours truly,

UNITED STATES MILLER.

E. HARRISON CAWKEN, Publisher.

"MILL FOR SALE" ads. Inserted once for \$2.00, or three times for \$5.00, cash with order.

"SITUATION WANTED" ads. 50 cents each insertion, cash with order.

Affidavit Concerning Circulation.

STATE OF WISCONSIN, ss.
MILWAUKEE COUNTY, ss.

E. HARRISON CAWKEN, editor and publisher of the United States Miller, a paper published in the interest of the FLOURING INDUSTRY, at No. 124 Grand Avenue, in the City of Milwaukee, and State of Wisconsin, being duly sworn, deposes and says that the circulation of said paper has at no time since Janu-

ary, 1882, been less than FIVE THOUSAND (5,000) copies per month; further, that it is his intention that it shall not in the future be less than FIVE THOUSAND copies each and every month; further, that he has paid for regular newspaper postage at the rate of two (2) cents per pound on domestic and Canadian newspaper mail for the years 1883 and 1884 the sum of \$423.74, showing an average of \$17.65 per month for 24 months; the average weight of domestic and Canadian mail being 882½ pounds per month and the total number of pounds of such newspaper mail sent out during the 24 months ending with December, 1884, being 21,180 pounds. Six copies of the U. S. Miller weigh about one pound. The above postage does not include postage paid on local or foreign papers, Canada excepted.

E. HARRISON CAWKEN.
Subscribed and sworn to before me this 7th day of January, A. D. 1885.

G. MCWHORTER,
Justice of the Peace, Milwaukee, Co., Wis.

THE formal ceremonies of the dedication of the new board of trade building in Chicago, took place April 29.

R. A. DANLIKER, the American agent for the Reiff-Huber brand of bolting cloth has removed his office to No. 150 La Salle st., Chicago, Ill.

TRADE SCHOOLS.—The jealousy with which mechanics and artisans first regarded the schools established to teach young men trades seems to be dying out. Workmen are perceiving that the schools do not graduate enough men to crowd the ranks; they see, too, that by raising the average quality of workmanship the schools indirectly assist the movement in favor of increased wages.

THE markets have been very unsteady during the past month, owing to the rumors of war between England and Russia. The latest advices (May 1,) indicate that there will be a peaceable solution of the matters of difference which have so seriously threatened to disturb the affairs of Europe. In these days of civilization it seems far better to adjust disputes between nations by arbitration than by war.

GERMAN THRIFT.—The Germans know how to make an honest penny as well as the shrewdest citizens of this great Republic. The consuls in different parts of Europe complain that the sale of agricultural implements of American manufacture has deplorably decreased. The reason why is to be found in the fact that our German cousins are willing to have us think for them, and ready to use the inventive genius of this country for their own gain. Lower wages allow them to put on the market a good imitation of our reaping and threshing machines; and, if they follow the pattern so closely that even the name of the American manufacturer is copied, it only shows their high appreciation of everything on this side of the water. We feel complimented, of course, but we also feel poorer.

MILWAUKEE FLOUR PRODUCTION.

From the most accurate figures which the UNITED STATES MILLER is able to obtain, the total amount of wheat flour manufactured by the Milwaukee flouring mills from January 1, 1885, to May 1, 1885, is 365,078 barrels. Some of the mills have run but a small portion of that time, and none have run all the time at full capacity. The Cream City Mill has lately been thoroughly overhauled and started up. The Centennial Mills have also been making some important changes and additions. All the mills are in good shape to run to full capacity whenever the market demands.

WATER WHEEL PLANT AT NIAGARA FALLS, N. Y. FOR CENTRAL MILLING CO.

On Page 20 we illustrate the setting of a 35 feet Victor turbine in the mill of the Central Milling Co., Niagara Falls, N. Y., now nearly completed. This wheel is placed under about 65 feet head, and will develop about 1000 H. P., furnishing power for driving the entire machinery of the mill including the elevator and also for moving cars. As will be seen, the wheel is placed in an iron flume at the bottom of a well sunk through solid rock, the water being conveyed to the wheel through an iron pen-stock, the connection between the pen-stock flume being provided with a valve for shutting off the water entirely from the wheel when necessary. Everything is of the most perfect and durable construction. This mill will have a capacity of about 2000 bbls. daily, and is, we believe, the largest mill now in process of erection on the globe. The plans and programme for this mill were made by U. H. Odell, Milling Engineer for Stilwell & Bierce Mfg. Co. of Dayton, O., and it will be equipped with Odell's celebrated roller mills, all of which together with the water wheel and iron work throughout the mill were furnished by them. The entire plant reflects great credit upon its owners and also upon Stilwell & Bierce Mfg. Co., whose reputation as manufacturers of flour mill machinery is world wide.

NEW PUBLICATIONS, ETC.

We acknowledge with thanks the receipt of a copy of the Fifty-second Annual Report of the Philadelphia Board of Trade by Secretary Geo. L. Buzby.

We have just received a copy of NUMBER SEVENTEEN of OGDEN'S POPULAR READING—price only 30 cents—containing the following seven stories—all complete—the price of EACH ONE of which, if issued in book form, would be 75 cents to \$1.50: "The Cloven Foot," by Miss M. E. Braddon; "Calamity Jane," by Reckless Ralph; "The Young Helress," by Edward Kirk; "Vivienne," by a popular author; "Folled," by Mrs. M. A. Holt; "See-Saw, Marjorie Daw," by a popular author; "Ninety-nine Readings and Recitations," by J. S. Ogilvie.

We have received from the U. S. Department of Agriculture a copy of the "Report of the Department of Agriculture for 1884," and also "The first Annual Report of the Bureau of Animal Industry."

THE weekly review of the flour product of Minneapolis by *The Northwestern Miller* for its issue of May 1, is as follows: The mills are not unduly crowding matters. The run last week was a strong one and the output was raised to a point only exceeded at the busiest time last fall. Out of eighteen mills, ten showed an increase in output and eight a decrease, there being among the former some of the larger mills. The flour production for the week ending Saturday was 142,886 barrels, against 132,200 barrels for the preceding week and 103,375 barrels during the corresponding time in 1884. On Wednesday twenty-one mills were running with a strong feed and it is quite probable that they will do as well as last week. For several days past less inconvenience has been experienced from wheat grinding "tough."

The markets have shown a fair improvement during the week, not so much in advanced quotations as a disposition on the part of buyers to take hold. They cannot be said to be doing so freely, as yet, as all are waiting for the outcome of the European entanglement. Notwithstanding this feeling of suspense nearly all buyers are taking

some goods, evidently thinking that if war is declared the advance will be much greater than the decline if peace be maintained.

The receipts were: Wheat, 559,600 bushels; flour, 145,488 barrels; wheat in store, Minneapolis, 3,594,794 bushels; St. Paul, 916,500 bushels; Duluth, 6,484,346 bushels.

NEWS.

A roller flour mill is being erected at Capetown, Africa.

A small mill is to be built this spring, at Fairbank, Dakota.

Wilson & Weaver have purchased Crowley's mill at Brookville, Kas.

A Kessler & Co. have bought M. Grossheart's mill at Kansas City, O.

The Ypsilanti Machine Works will shortly introduce a new roller mill.

James Wise & Co. have bought R. Torrence's mill at Rockport, Ky.

Williams & Winchester have bought out Horton & Sons, at Palmyra, Wis.

The Barnard & Leas Manufacturing Company now builds the Gordon reel.

The Greenwood Milling Co. succeed J. W. Hoover & Co., at Greenwood, Mo.

Staler & Engler, Center Valley, Pa., have been bought out by Stahler & Ruiker.

Thiers, Kuegle & Co. succeed C. Thiers & Son in the milling business at Columbiana, O.

The Sweetwater, Tenn., flour mill was burned April 10. Loss \$30,000; insurance \$15,000.

Flour mills will, probably, soon be erected at Lelleville, Tenn., and Dyersburg, Tenn.

John L. Lewis is contemplating the erection of a large oat meal mill at Grand Forks, Dak.

The Pillsbury B mill in Minneapolis, will probably be ready to start up about the middle of May.

L. M. Powers, Ottumwa, Iowa, is putting in rolls furnished by the Case Mfg. Co., Columbus, O.

In the new Pillsbury B Mill there will be no brandusters; centrifugal reels will be used instead.

The Morse bolt is about to be introduced in New York mills, a large number having been ordered.

The mill of the Eldred Milling Company, at Jackson, Mich., is nearly completed. It will start up in May.

The Garden City Millfurnishing Company, is having quite a large demand for its machines from Europe.

James Ellis & Co., flour merchants at Bradford, Pa., with liabilities of \$300,000, have suspended payment.

The Case Mfg. Co. Columbus, O., have an order for 1 No. 1 double purifier, from Langton & Co., Melissa, Tex.

Look Bros., of Bockenheim, Germany, have shipped a roller mill outfit to Jekateronburg, in Siberia, Russia.

Robert Flickinger, Atchison, Kans., is putting in a No. 1 single purifier from The Case Mfg. Co., Columbus, O.

Kuehne's dust-collector is said to have proved successful. B. F. Gump, of Chicago, manufactures the machine.

Giblin hand fire-grenades did good work recently in the flour mill at Barron, Wis. No mill should be without them.

Kaestner & Co., of Chicago, will soon have a roller mill on the market, which is expected to develop an enormous capacity.

A grain-cleaning machine, with an emery cone and rubber case, has been tried in Chicago, and, it is said, has proved successful.

The Dehner & Weurpel Mill Building Co., St. Louis, has placed an order with the Case Mfg. Co., Columbus O., for 5 pairs of rolls.

The Red River Valley Elevator Co. (office in Minneapolis), will erect twelve elevators of 30,000 bushels capacity each, this year.

There are at present about 6,300,000 bushels of wheat stored in elevators, vessels etc., in Duluth, awaiting the opening of navigation.

The Champion Mill Co., has been incorporated with a capital of \$1,000,000 for the manufacture and sale of flour, feed, etc., in New York City.

The Throop Grain Cleaner Company, of Buffalo, N. Y., is about to manufacture an English dust-collector, for which it has American rights.

The Pillsbury B Mill will be lighted by electric light. Incandescent burners will be placed in positions so as to render hand-lights unnecessary.

The Case Mfg. Co., Columbus, O., have closed contract with W. H. Dickson, Martel, O., for all the necessary machines for a 60-bbls. full roller mill.

The Case Mfg. Co., Columbus, O., have an additional order from C. E. Buck, Richmond, Va., for 2 pairs rolls with patent automatic feed.

A pickerel forty-four inches in length and weighing twenty-five and one-half pounds, was shot in the Montello, Wis., mill-pond by D. S. Perkins.

The Case Mfg. Co., Columbus, O., have an additional order for five automatic feed boxes, from I. A. Shollabarger & Co., Decatur, Ill., for their Smith purifiers.

It is rumored that a roller mill is to be manufactured at Silver Creek, N. Y., and that the works lately occupied by McNell & Spaulding will be used for that purpose.

W. N. Potts & Co. are rebuilding the Bonanza Mills burned last October at Richmond, Ky. The new mill will cost about \$80,000 and have a capacity of 180 bbls. per day.

John Finch has overcome the principal difficulties in connection with the Ortmann dust-collector, which has been secured by the Knickerbocker Company of Jackson, Mich.

The new flour mill to be erected at Duluth, Minn., will be a very large one and as complete and perfect in detail as modern skill can make it. That is the report any way.

Henry C. Yaeger, late of Kane, Ill., has purchased the 400-barrel flour mill at Carlinville, Ill., owned by Weir Bros. It will be overhauled and started up again as soon as possible.

The Wilford & Northway Manufacturing Co. of Minneapolis, is introducing a new roller mill, with six-inch rolls and belt drive. One of the machines is working in the Crown Roller Mill, Minneapolis.

Fond du Lac papers report that Caspar & Sons, millers at Calvary, Wis., made an assignment to John Reing, of Fond du Lac. The liabilities are not fully reported, but are estimated at from \$12,000 to \$18,000; assets about \$10,000.

A boy named Fred. Cummers, while assisting to put on a belt in Stevens mill at Tustin, Mich., had his clothing caught in a rapidly revolving shaft, and was horribly mangled. His death was instantaneous.

The citizens of Lamberton, Redwood Co., Minn., offer a bonus of \$2,000 to any one who will build a 100-barrel roller flour mill at that place. Communications should be addressed to F. Ries, Lamberton, Minn.

One of the Phoenix Works (Minneapolis) three-high screenings roller mills has been ordered by G. V. Hecker & Co., of New York. This machine has the only practical belt-drive for a three-high roller mill yet introduced.

The Case Mfg. Co., Columbus, O., have an order from the La Grange Milling Co., La Grange, Ind., for one 5-reel scalping chest, and one "Case" centrifugal reel; also an additional order from H. L. Smith & Co., Lawrence Kans., for rolls.

C. McRoberts, head miller for Duchel Bros., Soto, Mich., writes the Case Mfg. Co.: "I have run the mill alone for 1 week, bought the wheat, packed the flour, and ground 28 bushels of wheat per hour; we have the best running mill on the Huron River."

New milling enterprises are contemplated at Athens, Ga.; Stewartville, Ky.; Jackson, Ga.; Sharps, Ky.; Hillsborough, Texas; Loretto, Tenn.; Onancock, Va.; Palatka, Fla.; Coopertown, Tenn.; Liberty, Va.; Appleton, Ga.; Augusta, Ky.; Corning, Ark.; Stone Mount, Ga.; and Newmanville, Fla.

The Case Mfg. Co., Columbus, O., have orders from the Planken Turbine Co., Dubuque, Iowa, for 8 pairs rolls for Henry Meder, Mederville, Iowa; and 8 pairs for J. H. Carnell, Correctionville, Iowa—all with patent automatic feed; also from W. T. Pyne, Louisville, Ky., who has placed an additional order with the Case Mfg. Co., Columbus, for rolls to be shipped T. J. Morris, Bowling Green, Ky.

It appears from carefully collected statistics that the total number of boiler explosions in the United States in 1884 was 152, by which 254 people were killed and 261 others injured. This number falls slightly

below that of the preceding year. The saw mill boiler is down for 59 of the explosions. The percentage in 1884 was 87 per cent. of all the explosions, instead of over 40 per cent. of the year before. There was a falling off of two in the number of locomotive boiler explosions from the record of the preceding year.

BURNED.—April 9, W. J. Phelps' mill at Millers Falls Mass.—loss \$5,000, insurance \$4,000; April 10, the mills at Sweetwater, Tenn.—loss \$80,000, insurance \$15,000; March 9, E. J. Ross' mill at Empire, Ill.—loss about \$10,000; April 6, Ed. Melchur's mill, near Reading, Pa.—loss about \$10,000, insurance \$5,000; April 8, Rohrbach Bros' mill at Bowers Station, Pa.—loss \$15,000, insurance \$6,000; April 13, Joseph Harps' mill, near Ellerton, Md.—loss \$6,000, no insurance; April 13, Taylor's mill at Mt. Pleasant, Iowa—loss \$12,000, insurance \$5,000; Baden & Nelson's mill near Stillwater, Minn., April 14, loss about \$3,000, insurance \$1,500.

About two years ago The Case Mfg. Co., Columbus, O., furnished M. E. Moore, of Waterville, Kas., a complete outfit of breaks, rolls, purifiers, etc., for a full roller mill on the "Case" system. A few weeks ago the mill was destroyed by fire. Mr. Moore concluded to rebuild his mill, and being well pleased with the Case machinery, he has again placed his order with the same company for a complete outfit of breaks, rolls, purifiers, scalpers, etc., for the new mill, which speaks well for the Case machinery.

The Case Manufacturing Co., Columbus, Ohio, have received the following orders the past month: From A. L. Strang Co., Omaha, Neb., for rolls, purifiers, centrifugal reels, scalping reels, bolting reels, etc., for a complete gradual reduction mill on the "Case" system, using 10 pairs rolls; from Dehner Weurpel Mill-building Co., St. Louis, Mo., for 5 pairs of rolls with patent automatic feed; from H. Smith & Co., Grafton, Wis., for 2 pairs rolls, with patent automatic feed; from Johnson & Wentfinger, Jefferson, Wis., for a full line of breaks, rolls, purifiers, scalpers, centrifugals, and bolting reels, and all necessary machinery for a complete gradual reduction mill on the "Case" system; an additional order for 1 pair rolls, with patent automatic feed, from H. C. Smith & Co., Lawrence, Kas.; from J. A. Parker & Co., Terre Haute, Ind., for rolls to be shipped to Eaton & Parks, Sullivan, Ind.; from Sinker, Davis & Co., Indianapolis, Ind., 2 additional pairs of rolls for the Zrystal Palace Milling Co., Wetherford, Tex.; from the Lehman Grinding Disk Co., Kansas City, Mo., for 4 pairs of rolls with patent automatic feed, for Bowman Bros., Dale & Co., Pawnee Rock, Kas.; they have also been awarded the contract of the Carmel Milling Co., Carmel, Ind., for a full outfit of breaks, rolls, purifiers, centrifugal reels, bolting reels, and all necessary machinery for a complete reduction mill on the "Case" system, using 12 pairs of rolls; the contract of Wm. Rathman, Uniontown, Ky., for a complete outfit of breaks, rolls, purifiers, centrifugal reels, scalping reels, &c., for a full roller mill on the "Case" system; the contract of Poorman Bros., Anthony, Kas., for all the necessary machinery for a complete roller mill on the "Case" system, using 12 pairs rolls with patent automatic feed.

HE COULDN'T MAKE IT OUT.—The proprietor of a tannery, having erected a building on the main street for the sale of his leather, the purchase of his hides, etc., began to consider what kind of a sign would be most attractive. At last what he thought a happy idea struck him. He bored an auger-hole through the door-post and stuck a calf's tail into it, with the bushy end flaunting out. After a while he noticed a grave-looking person standing near the door, with spectacles on, gazing intently at the sign. So long did he gaze that finally the tanner stepped out and addressed the individual:

"Good morning!"
"Morning," replied the man without moving his eyes from the sign.
"You want to buy leather?" "No."
"Want to sell hides?" "No."
"Are you a farmer?" "No."
"Are you a merchant?" "No."
"Lawyer?" "No."
"Doctor?" "No."
"Minister?" "No."
"What in thunder are you?"
"I'm a philosopher. I've been standing here half an hour trying to decide how that calf got through that auger-hole, and for the life of me I can't make it out!"—*Every Other Saturday.*

ITEMS OF INTEREST.

HEALING PROPERTIES OF WATER.—There is no remedy of such general application and none so easily attainable as water, and yet nine persons in ten will pass it by in an emergency to seek for something of less efficacy. There are but few cases of illness where water should not occupy the highest place as a remedial agent. A strip of flannel or a napkin, folded lengthwise and wrung out of hot water and applied around the neck of a child that has the croup will usually bring relief in ten minutes. A towel folded several times and quickly wrung out of hot water, and applied over the seat of the pain in toothache or neuralgia will generally afford prompt relief. This treatment in colic works like magic. We have known cases that have resisted other treatment for hours yield to this in ten minutes. There is nothing that will so promptly cut short a congestion of the lungs, sore-throat, or rheumatism, as hot water when applied promptly and thoroughly. Pieces of cotton batting dipped in hot water, and kept applied to all sores and new cuts, bruises and sprains, is the treatment now generally adopted in hospitals. Sprained ankle has been cured in an hour by showing it with hot water, poured from a height of ten feet. Tepid water acts promptly as an emetic, and hot water taken freely half an hour before bed-time is the best of cathartics in the case of constipation, while it has a most soothing effect on the stomach and bowels. This treatment continued for a few months, with proper attention to diet, will alleviate any case of dyspepsia.

SHE COST HER WEIGHT IN GOLD.—Mrs. Jesus Castro, an aged Mexican lady, now residing at American Flag, in the Santa Catalina mountains, is perhaps the only woman who, literally speaking cost her husband her weight in gold. It is said that in the early gold-digging days of California, she was a resident of Sonora, in which state she was born and grew to womanhood. When about the age of 17 a paternal uncle, but a few years her senior, returned with his companions, gold-laden, from the El Dorado of the West, and became desperately enamored of her. He sought her hand in marriage and was accepted, but the church refused, because of the near relationship existing between them, to solemnize the marriage. Persuasion being in vain, he tried the power of gold to win the church his way, and succeeded only by the payment of her weight in gold. She at the time weighed 117 pounds, and against her in the scales the glittering dust was shoveled. Her affianced husband still had sufficient of this world's goods to provide a comfortable home, and they were married. They lived happily together, and she bore to her husband eleven children. In the course of years he died and she married again, Mr. Castro being her second husband. The above is a fact, and not fiction, as living witnesses can prove.—*Tucson Star*.

ELECTRIC BOILER CLEANERS.—Electricity is being advantageously applied in Calais for removing the incrustations from boilers. Two poles of a battery of ten to twelve Bunsen elements are applied to the ends of the boilers, and after 30 to 40 hours the deposits fall from the sides to the bottom. When a boiler has been thus cleared the formation of new deposits may be prevented by applying a much

less energetic current under the same conditions.—*Brooklyn Eagle*.

AN Atlanta, Ga., man claims to have discovered a new principle in hydraulics that will revolutionize pumping. Hitherto it has been an established belief that water will not rise in a vacuum to a height of more than 33 feet. For that reason pumps are generally set within 26 feet of the water. By the new discovery the pumping machinery can be put on the surface of the earth, and as far from the water as is necessary. The inventor claims to have pumped water out of an artesian well in Texas 600 feet deep.

THE remarkable telegraphic apparatus recently devised by Messrs. Hathaway and Linville, of Philadelphia, is a striking illustration of the constant progression and development of human ingenuity. This machine renders telegraphy as simple as operating a writing-machine, and it promises to revolutionize the telegraph business. With it there is no use for the expert telegrapher, as any one who can operate an ordinary type-writer can send messages. In front, it is like a type-writer, the letters and numerals standing up on elevated keys. The keys start variously graduated currents of electricity which traverse the connecting wire, sometimes meeting and passing in opposite directions. The touching of a key produces a letter on the paper of both the sending and receiving instruments, for both are alike. Each machine serves for either use, and can be worked as fast as a skillful type-writer operator can touch the keys. One great advantage is, the message cannot be read by sound, thus securing privacy. It is applicable to any system of wire communication and is capable of working with any number of tributaries. A company has been formed in Philadelphia to control the patents, and \$2,000,000 of capital stock has been issued, but no shares are for sale. The president is Mr. Thomas Cochran, of Philadelphia, who has given assurance that the details published regarding the invention are substantially correct.—*Bradstreet's*.

THE LUMBER TRADE IN 1884.—The *Northwestern Lumberman* has collected elaborate statistics of the production of white pine lumber in the Northwest, giving the output of nearly every mill last year. The total production for twelve years is given as follows, in thousands of feet:

YEAR.	M. FT.	YEAR.	M. FT.
1873.....	3,063,780	1879.....	4,800,043
1874.....	3,751,306	1880.....	5,651,205
1875.....	3,908,553	1881.....	6,768,857
1876.....	3,879,046	1882.....	7,552,151
1877.....	3,605,333	1883.....	7,324,790
1878.....	3,629,473	1884.....	7,635,023

It appears from this that the production last year was four per cent. more than the year before, but in some of the lumber districts only a comparatively small part of the year's production was marketed.

THE latest experiment in the organization of industry comes from Russia, where the employes at the large engineering works belonging to the firm of Struve & Co. have recently been planted in a complete settlement somewhat like Pullman City in the state of Illinois. The workmen, of whom there are between 3,500 and 4,000, are all lodged in small cottages, most of which are made to accommodate two families only, while the public institutions of the colony include a refectory, a laundry, a hospital, a benefit society; but charity in any other form is quite

unknown in the place. The co-operative society pays a flourishing dividend. It would be curious if Russia, which is a survival of the past in its village communities of an agricultural type, were also to be a pioneer of the future in village communities of an industrial type.

THE BEST TOOL ALWAYS THE CHEAPEST.—Practically, the price paid for the tool which will do the work in the best and cheapest manner is of no consequence. The difference between the lowest priced machine tool to be found in the country and the best one which money can buy for a given purpose, is so small compared with the difference in the amount and quality of the product, as to make the first cost an entirely secondary consideration.

AN English officer, who has seen service in Egypt, states that the food of the Arabian horse consists of six pounds of barley, which is given at sunset. This custom seems to agree with the animal, and it enables his owner to carry in a bag food enough—sixty pounds—for a ten days' journey across the desert. The stomach of the horse is small, and for this reason it is the custom in agricultural countries to give him three meals a day. But in Arabia they make a virtue of necessity. Fast is broken but once in 24 hours.

A DIAMOND WEIGHING NEARLY 200 KARATS.—In a small morocco case in the New-York office of D. L. Van Moppes, the diamond merchant, lay a crystalline lump yesterday, which was almost pure white, save for a yellowish tinge toward the extreme angles. It was a diamond which probably contains the finest material and is of the most perfect shape of all diamonds approaching its size in the world and certainly in America. It tipped the dainty little scales at the extraordinary weight of 192 karats. It comes from the Kimberly mine of the South African diamond fields and has been in the possession of the firm for some time. The elder Van Moppes of Paris sent the stone to America for exhibition merely, as no price has been set upon it. Holding it up to the light its wonderful beauty, even in its uncut state, was seen. Its crystalline form is perfect, the sharp points only having been ground off to guard against the danger of fracture from a sudden fall. Save for one minute speck close to the surface it is flawless as far as can be judged at present, and its perfect shape will allow it to be cut to extreme advantage so that the loss will be in the neighborhood of 70 or 80 karats, and the cut stone will therefore weigh about 110 to 115 karats. The parent house of Van Moppes is in Paris, but the cutting house is in Amsterdam, where many men are employed; here it is likely this stone will be cut.—*N. Y. Tribune*, April 20.

HOW GOOD BREAD IS MADE.

The Boston woman who wrote this homily on the bread question seems to know precisely what she is talking about. Hear her: "Why any one who has been busy since last summer in making the bread needed in a family of any size could fail to solve that problem I am unable to comprehend. I was taught to make bread many years ago, by a grandmother who was a lady of the olden time. A life of happiness, and, much of the time, of prosperity, so filled my days that my bread knowledge was not called in question for many years, except to name the

faults I would find with it if we made a change of cooks and the texture varied.

"At last a change came for me in life, and to help keep our home I received a few young ladies into it for educational purposes. With a good deal of the practical about me, I soon decided that those girls should have added to their studies as much of a knowledge of cooking as I could crowd in without too great a pressure. The first step was bread-making, and from Jan. 1 until they went home in June they made all the bread we used, each taking a week. There were four of them, and every morning during those months we had, as had always been the habit, warm rolls on the table as well as cold bread. I can not recall the loss of one batch of bread from any cause, or poor bread during that time. Previous to that time I had taken some charge of bread myself, as it had seemed wise to train less expensive servants than we formerly employed. This gave me fresh experience.

"It was our never-failing hot home-made rolls that inspired the girls with a desire to excel in that line, and the work was voluntary with them, not required. Soon, however, there was a strife as to which did excel. I always was sure what the result would be, because rules acquired by observation were held to. The average heat of a kitchen during hours when a good fire is in use can soon be learned. Compressed yeast is far quicker in its effects than old fashioned yeast, and as that was used we could count accurately upon the results. About 5 P. M. a sponge was set with two quarts of all milk, or half water, as the case might be. Flour was sifted in a deep bowl; and the milk was lukewarm. In a little of the hot water was melted a tablespoonful of butter, a small tablespoonful of sugar, and an even teaspoonful of salt. In the centre of the sifted flour this was stirred until enough was wet for a sponge, the yeast added. Two hours later, the sponge was light and the bread kneaded, a work of but a few moments. I always sat by the table to suggest from time to time.

"Just before retiring, after an hour or more with studies, say 9 P. M., two small pans, holding eight to ten rolls each, were buttered and filled. The rolls made less than half the size wished when baked, to allow for rising, and consequently placed some distance apart. These pans were placed in the ice-chest, or in the store-room if freezing weather. The cook merely had to take them to the kitchen in the morning, and while her oven was heating the warmth of the kitchen would soon bring the rolls to the exact condition for baking. The remaining dough was kept on ice, or below freezing point, and used for a night or two. Bread once light can not be made heavy or injured by cold, neither need it be sour. I never used an atom of soda to sweeten sour bread. These ideas are given for winter use. Spring and summer heat requires a change of hours. I had never failed in securing good bread from servants, but I do make it a rule to give personal attention to it for a month, and the habits thus formed remain. I don't mean by this that I make it, for I do not, but I sit by and have all done carefully.

"Now about the oven, as the best bread can be spoiled there: It must be a habit to brush out all the places where ashes can col-

let at least once a week. An ordinary sized loaf of bread requires about an hour to bake. Coal should never be heaped to the lids, as the oven does not heat as well; evenly filled as high as the fire brick is enough; dampers adjusted, time watched, and rolls are ready in twenty minutes; bread from an hour to an hour and a half, depending upon the quickness of oven. No machine need be invented to take the place of common sense, and that, in full exercise with a person who is methodical, solves the problem. Your bread under such culture will run as regularly as your clock, providing that these conditions are enforced. It is natural to try an oven with the hand, but raising the lid of the range will tell me any moment whether that is a fire I can bake with or not, and just how long I can rely upon it, for it is better not to add coal during the process of baking."

NONSENSE.

NO SIMILARITY.—"Darling," he said, as he tried to tickle his wife under the chin, "why am I like the moon?"

"You are not like the moon, John Henry, in any particular."

"Why, how do you make that out, my dear?"

"Because the moon has been full but twice this month."

He says that isn't the right answer.

EFFECT OF EATING PIE.—Jones—"A queer thing happened in New York the other day. A horse stole three pies from a baker's wagon and ate them."

Smith—"I should like to have seen that baker. He must have been astonished."

"Astonished! He was mad; in fact driven to desperation."

"Why, what about?"

"The loss."

"The loss of the pies?"

"No; of the horse. It was the only one he had."

"Who left that door open?" growled Mr. Dinkle, looking up from his desk one of those freezing days last winter.

"I did," answered the new office boy.

"Can't you ever learn to shut a door?"

"I s'pose so, sir."

"Well, why in thunder don't you do it?"

"I'm goin' to; but you see I'm new yet, and I had so much to learn that I thought I'd leave the door be till along toward the last."

"GOING with your bride to select your table ware, are you? Well, young man, let me give you a hint. Buy light cups and small plates. Many a man and wife have been seriously injured in a dispute by big plates." And old Mr. Budger chuckled and rubbed his head, and the happy couple passed on.

HIS QUALIFICATIONS.—"Here's a musical salesman advertised for. Why don't you apply, Ned?"

"If? Why, I'm not musical."

"Perhaps not; but I notice that you can blow your own horn, you're familiar with bars, you are always giving notes and all the rest."

IN 1850 Elder Littlejohn offered up the following original prayer, which, though intended for Indiana, will fit other states: "O, Lord! there is great wickedness and much drunkenness in our young and rising towns. Therefore, O Lord, we crave Thy blessing. Now, Milwaukee, just sprung up, is bad; Chicago, another mushroom, is worse. Yet do Thou,

Lord, bless and improve them. Then, there is Michigan City, a place of sand and whisky, and La Porte of mud and wickedness; and indeed they need Thy blessing. And there is South Bend, and also Niles, where they think themselves righteous, but they are full of rum-holes and rottenness. Lord, they need Thy blessing. And here in Mishawaka, which boasts itself something, but has nothing but self-righteousness, good Lord, open its eyes, that it may receive Thy blessing. Then we have Elkhart, and Bristol, and Mottville, little things, but wicked. Do, Lord, bless them. [Then pausing for breath and raising his voice to the highest pitch.] And, lastly, then, dear, good Lord, even bless Constantine, where Gov. Barry sells whiskey at three cents a glass. Amen."

NORA'S BALANCE.—Last summer, during the excitement owing to bank failures in Indianapolis, I was watching the anxious crowd besieging the doors of a bank that was supposed to be in danger, when I overheard the following dialogue between an Irish woman and her husband:

"Nora, dhraw yer money out."

"An' shure, Patrick, I won't."

"But, Nora, you musht dhraw it out."

"Faithan' I won't draw me money out at all."

"Nora, an' don't yees know they'll lose yer money for yees ef yees don't dhraw it out."

"An' shure, Patrick, ain't they better able to lose it than we are?"

Patrick was evidently overpowered with this last astonishing and unanswerable argument, and they both left the scene apparently satisfied. Fortunately the bank survived the pressure, and its ability to lose Nora's balance was not practically tested.—*Editor's Drawer, in Harper's Magazine for May.*

A BAD BREAK.—Sam. Peterby, a merchant from the interior, while attending the Mardi Gras festival at Galveston, united business with pleasure by purchasing a bill of goods from a prominent firm. He was very politely received, and one of the proprietors showed him over the immense store. On reaching the fourth floor the customer perceived a speaking tube on the wall, the first thing of the kind he had ever seen.

"What is that?" he asked.

"Oh, that is a speaking tube; it is a great convenience. We can converse with clerks on the first floor without the trouble of going down stairs."

"Can they hear what you say through that?" asked the visitor.

"Certainly; and they can reply at the same time."

"You don't say so!" exclaimed the visitor.

"May I talk through it?"

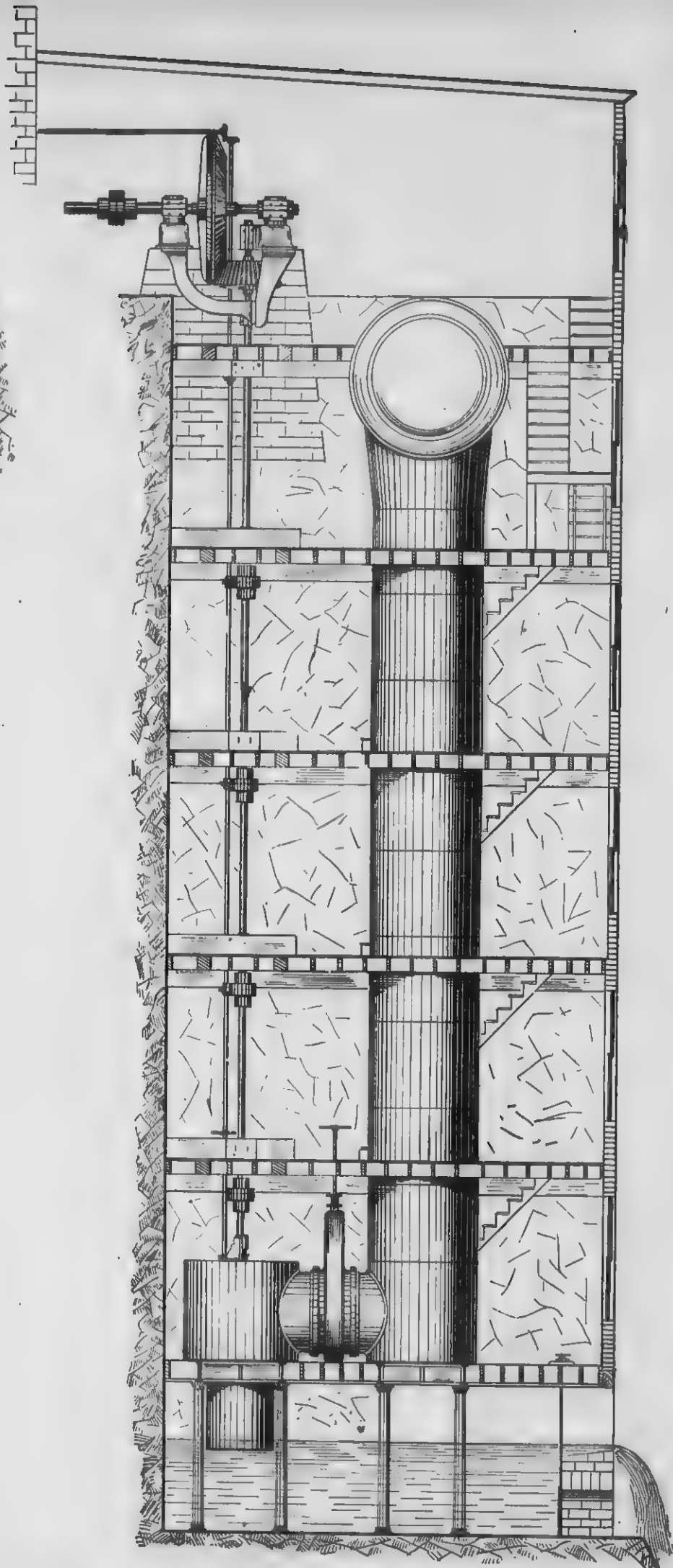
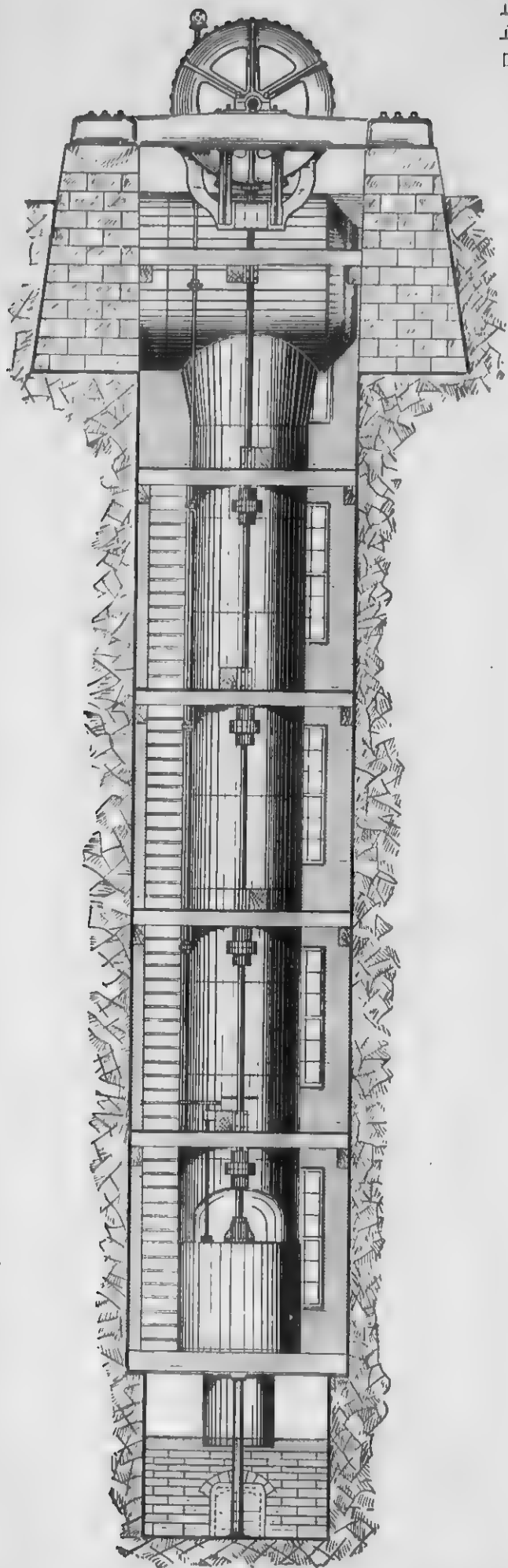
"Certainly," was the reply.

The visitor put his mouth to the speaking tube and asked: "Are Sam. Peterby's goods packed up yet?"

The people in the office must have supposed it was somebody else speaking, for a moment later the distinct reply came back: "No. We have not packed them up yet. We are waiting for a telegram from his town. We believe he is a slippery cuss."

Tableau.—*Texas Siftings.*

Isn't it awful?" cried Julia, as a dog in the agony of fright went scurrying past with a kettle tied to his tail. "Yes, indeed," replied Jones, "I guess there won't be much left of the kittle."



THE NEW YORK PRODUCE EXCHANGE BILL OF LADING.

Last Saturday's *N. Y. Journal of Commerce* (April 25) says: The correspondence which has been for some time in progress between the special committee of the New York Produce Exchange and the Liverpool Shipowners' Association regarding the bill of lading adopted by the Exchange, in which the Liverpool Association sought to introduce various modifications, has borne substantial fruit in producing full accord between the two bodies. The Board of Managers of the Produce Exchange yesterday approved the modified form agreed on as the result of this correspondence, but continued the special committee, consisting of Messrs. Gustav Schwab, chairman, David Bingham and Charles F. Wrenks, secretary, with power to make further modifications and to correspond with other bodies in order to secure their co-operation in the adoption of the bill. We have already stated that the special committee of the Chicago Board of Trade, with which the New York committee have been in correspondence, have practically resolved on making their adhesion to the form, so far as through bills are concerned, giving further consideration to the form of a lake bill.

The modifications of the Produce Exchange bill, as compared with its original, adopted at the "Conference of the Association for the Reform and Codification of the Law of Nations," are very considerable, but the changes now made are not numerous nor fundamental, though some are rather important. The first is the introduction in the clause stipulating for delivery at the port, of the words "or as near thereto as she may safely get," the insertion of which is optional

with the carrier. The words "and primage (if customary) in cash without discount," or "with primage" may be likewise inserted at the carrier's option. The clause giving the carrier liberty to convey goods in lighters to and from the ship at the risk of the owners of the goods, is varied somewhat in form. The carrier's exemptions for loss or damage are enlarged by the inclusion of "causes beyond his control, riots, strikes, or stoppages of labor, heating," errors or insufficiency of marks, numbers, address, or description (the absence of these marks, etc., was already provided for); "risk of craft, hulk or transshipment." The loss by fire, is further defined as an excepted risk "wheresoever occurring," and the exemption from liability on account of latent defects, etc., in hull and machinery, is extended to "appurtenances." It is stipulated that "the holder of the bill of lading" shall be bound by its conditions on acceptance, as well as the shipper, owner, and consignee of the goods, as fully as if signed by them. Finally; the clause specifying the number of bills issued concludes with the proviso: "One of which being accomplished, and given up to the carrier, the others to stand void." The words in italic letters are new.

MILLING PATENTS.

The following list of patents relating to milling interests granted by the U. S. Patent Office, during the past month, is specially reported by Stout & Underwood, Solicitors of Patents, 66 Wisconsin st., Milwaukee, who will send a copy of any patent named to any address on receipt of 50 cents.

Issue of March 31, 1885.—No. 314,571—Bag-holder, W. B. Emmons, Pettisville, Ohio; 314,627—Feed Regulator for roller mills, F. M. Tatlow, Hannibal, Mo.; 314,668—Blast-regulator for grain separators, J. Grabe, Newark, Ohio; 314,770—Bag-holder, W. Yerdon, Port Plain, N. Y.; 314,776—Machine for dressing millstones, I. B.

Baker, Port Allegheny, Pa.; 314,844—Pulp Grinders, W. H. Howell, Thorold, Ont.; 314,850—Apparatus for crushing and Grinding malt, etc., E. Kanfield, Pittsburg, Pa.; 314,977—Mill-stone Dress, J. R. Price, Hickory, Miss.

Issue of April 7, 1885.—No. 315,143—Machine for breaking wheat, H. Hudson and S. M. Tobey, Salinas, Cal.; 315,146—Pulverizing Apparatus, W. A. Koneman and H. H. Seyville, Chicago, Ill.; 315,155—Wheat Scourer, T. Mc. Cuddin, St. Louis, and A. F. Shearlock, Festus, Mo.; 315,201—Roller Mill, J. L. Wilford, Minneapolis, Minn; Re-issue, No. 10,579—Roller Grinding Mill, F. Wegmann, Zurich, Switzerland.

Issue of April 14, 1885.—No. 315,506—Grain Dryer, E. W. Johnson, Trumansburg, N. Y.; 315,538—Grain-cleaner, F. M. Lynott, Toronto, Ont.; 315,585—Grain Meter, E. N. Williamson, Lodge, Ill.; 315,594—Green corn cutting-machine, A. P. Wood and W. E. Lindsey, Baltimore, Md.; 315,683—Grain-measuring Apparatus, O. P. and Q. E. Wagner, Pontiac, Ill.

Issue of April 21, 1885.—No. 315,900—Machine for Cleaning Grain, M. D. Beardslee, Milwaukee, Wis.; 315,997—Grain-scourer, M. D. Beardslee, Milwaukee; 316,063—Grain-cleaning and Drying Machine, J. Ritchie, Liverpool, Eng.; 316,068—Screening Apparatus, O. Schlickeysen, Berlin, Germany.

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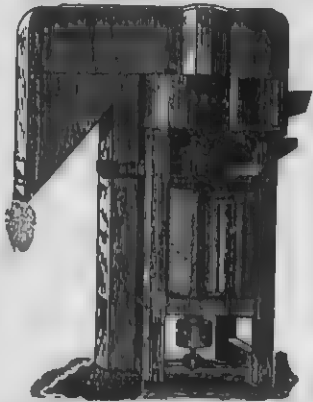
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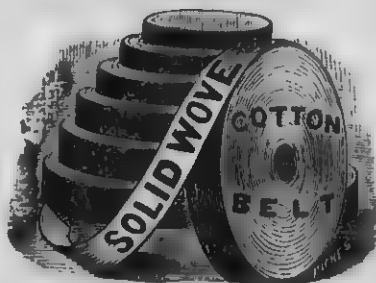
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No pains or expense have been spared to make this Directory as complete and accurate as possible. More than 30,000 circulars and innumerable letters were sent out to obtain information necessary for the compilation of this work. The volume contains over 200 large pages, no advertisements. It shows that there are in the United States of America and our neighboring Dominion of Canada 25,050 flouring mills, taking them as they go, great and small. The work indicates in about 9,000 instances the kind or kinds of power used by the mills, the capacity in barrels of flour per day. It further indicates cornmeal, buckwheat, rye-flour and rice mills. It shows that the number of mills in the various states and territories of the United States are as follows: Alabama 453; Arizona 17; Arkansas 343; California 222; Colorado 54; Connecticut 288; Dakota 81; Delaware 98; District of Columbia 5; Florida 66; Georgia 631; Idaho 21; Illinois 1123; Indiana 1089; Indian Territory 14; Iowa 790; Kansas 489; Kentucky 713; Louisiana 61; Maine 28; Maryland 353; Massachusetts 340; Michigan 846; Minnesota 487; Mississippi 386; Missouri 1025; Montana 21; Nebraska 25; Nevada 13; New Hampshire 182; New Jersey 442; New Mexico 32; New York 1902; North Carolina 848; Ohio 1443; Oregon 145; Pennsylvania 3142; Rhode Island 51; South Carolina 274; Tennessee 801; Texas 730; Utah 110; Vermont 247; Virginia 781; Washington Territory 61; West Virginia 447; Wisconsin 777; Wyoming 2.

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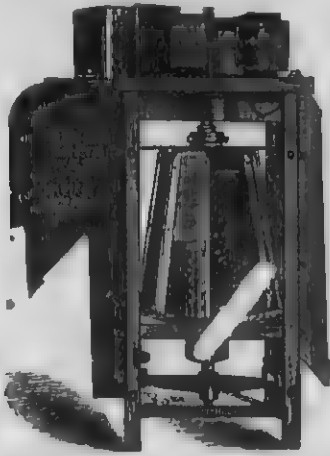
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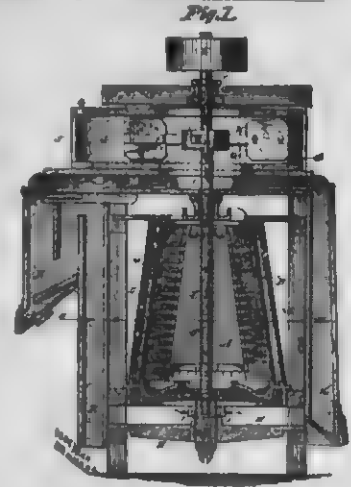
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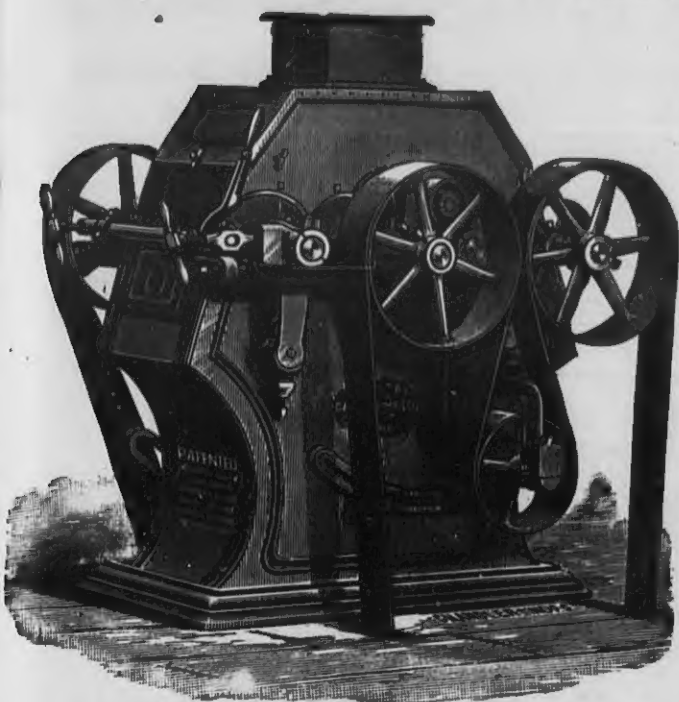
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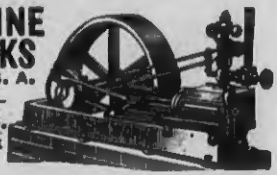
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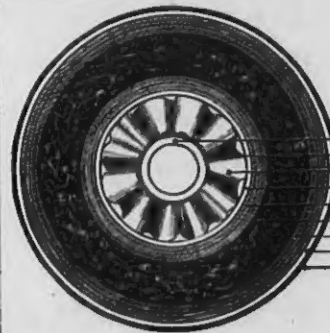
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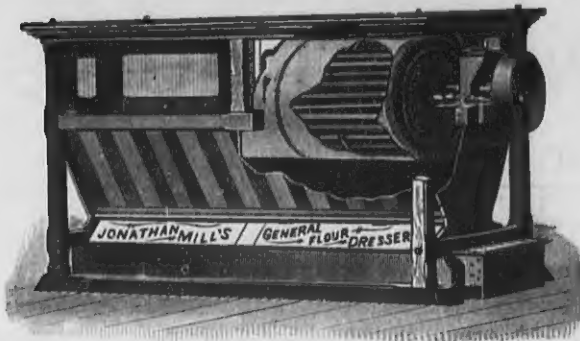
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